Primary Industry Studies No. 2

THE INCOMES OF SALMON FISHERMEN IN BRITISH COLUMBIA 1953-1954

D.R. Buchanan and B.A. Campbell

Economics Service

DEPARTMENT OF FISHERIES OF CANADA

OTTAWA
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FOREWORD

The salmon fishery has held an important place in the economy of British Columbia from the earliest days of settlement. Today, in value terms, it accounts for about two-thirds of the production of the province's primary fishing industry and is the major source of fishermen's income.[1] Sockeye, the most important species commercially, is currently sold by fishermen at prices ranging from 26 to 32 cents per pound - representing an average price per fish of about $2. Fishing operations for sockeye and the other salmon species give employment in season to nearly 10 thousand fishermen and the total catch is valued at more than $20 million annually.

The salmon fishermen of British Columbia have higher incomes, on the average, than any other large group of Canadian fishermen. Most of them now operate with modern fishing craft and gear, and their productivity generally is on a high level for the fishing industry. The secondary industry, the market for practically the whole of the salmon catch, is also well developed. Canneries and other processing plants are located at strategic centers along the coast and the collection of fish from the grounds or from local buying camps is efficiently organized.

Salmon fishermen enjoy an advantage in the character of the resource exploited. The concentrations of salmon occur in the approaches to the river estuaries, for the most part in sheltered waters - where they can be taken with trap, purse-seine or gillnet - during the course of their spawning migration from the ocean. These migrations take place in the summer and early fall when weather conditions are conducive to peak fishing activity.

Many salmon fishermen also can make use of alternative sources of income in off-season periods, in contrast with certain groups of fishermen in other parts of Canada - particularly in areas lacking adequate transportation facilities - where there is less opportunity to supplement income obtained during a short annual fishing season with earnings from employment outside the fishing industry.

Salmon fishermen labour under several disadvantages, however. The salmon runs vary considerably in size from year to year. This variation operates in conjunction with relatively high fixed costs to produce sharp fluctuations in fishermen's annual incomes. Fluctuations in the aggregate income of all fishermen are related not only to the total volume of the catch but also to the proportion of the highly-priced sockeye in this total - a proportion varying widely from district to district and from year to year, in accordance with the life cycle of the species.

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1 In recent years, the value of the B.C. salmon catch as landed has represented almost one-quarter of the Canadian total. It is followed in order of importance by the Atlantic groundfish and lobster fisheries.

Apart from fluctuation in the aggregate, the incomes of individual salmon fishermen differ greatly in any given year. These differences arise partly from variation in efficiency of equipment among fishing enterprises and partly from such factors as "effort", i.e., man-days fishing, etc., and the abundance of fish on the grounds. The limited adaptability of certain types of equipment makes it necessary for some fishermen to rely on only one or two species as the major source of income.

Because of the importance of the salmon fishery in the economy of British Columbia, changes in the volume of the catch, in prices and in fishing costs have a significant influence on the well-being of a large segment of the province's population. We present here the results of an investigation of the changes in the income of salmon fishermen in British Columbia between the seasons of 1953 and 1954 and of the differences in income among salmon fishermen in each of those two years. The investigation was initiated by the Honourable James Sinclair, Minister of Fisheries, at the request of the fishermen's and fish processors' associations of the province.

While the principal objective was the investigation of salmon fishermen's incomes, earnings from other fishing activities were included. Almost half of the number of fishermen in the group interviewed engaged in operations for species other than salmon: chiefly herring and halibut. Non-fishing income, i.e., earnings from occupations outside the fishing industry and other receipts, formed a significant part of the total annual income of the fishermen in this group and was also included in the investigation.

The investigation was conducted on a sample basis. Records were obtained from over 200 fishermen, or roughly 2.5 per cent of the total group involved. Questions of representativeness and the like are discussed in the section on methodology which will be found in the appendix to this report.

The investigation was organized by F.E. Popper, staff economist of the Fisheries Prices Support Board, with the assistance of B.A. Campbell, chief of the Pacific Area unit of this Service. After Mr. Popper's departure to join the Fisheries Division of FAO in the summer of 1954, responsibility for the investigation was assumed by D.R. Buchanan of our headquarters' staff.

A large number of people have contributed, in one way or another, to the success of the investigation. Officers of the fishermen's organizations provided advice and publicity for the work among their membership. The office staffs of the fish-processing companies made available to our field workers statements of settlement on behalf of a large number of fishermen. The Department's Chief

Supervisor for the Pacific Area, A.J. Whitmore, and his district supervisors, local fishery officers and patrol-boat crews arranged for the transportation of these field workers and gave much help and guidance throughout the course of the investigation. The contribution of all these is gratefully acknowledged.

In addition to Mr. Campbell and Mr. Buchanan, the following employees of the Department took part in the field work for the investigation: J.A. D'Andrea, H.G. Dane, A.D. Hall, P.N. MacLeod and G.R. Morgan. They were assisted by J. Harris and R. Matchett who were employed especially for this work on a temporary basis. To these, and to the clerical and typing staffs of the Service at Ottawa and Vancouver who helped with the tabulation of data and the preparation of this report, the writers' thanks are extended.

Lastly, acknowledgement must be made of the cooperation of the group of fishermen whose business activities are analysed in this report and without which the whole project would have failed.

An interim report of findings for the 1953 season was published in January, 1955, and this was followed by a brief progress report covering the 1953 and 1954 seasons in December, 1955. The present report has somewhat greater scope than the earlier publications. Besides information on the structure of salmon fishermen's income in each of the years mentioned, the changes from one year to the next are analysed in detail and the factors established that appear to have caused these changes. An outline of the historical development and present conditions of salmon production and marketing on the Canadian Pacific coast is also included, as background material.

W.C. MacKenzie, Director,
Economics Service.

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PART 1

PART 1

DEVELOPMENT OF THE SALMON FISHING INDUSTRY

1. Geographic Features of the Coastal Fishing Areas

The geographic features of the Canadian Pacific Coast are markedly different from those of the Atlantic Coast. Unlike the wide continental shelf extending up to several hundred miles seaward from New England, Nova Scotia and Newfoundland, the continental shelf in British Columbia is narrow, extending 10 to 45 miles seaward from Vancouver Island and the Queen Charlotte Islands. The banks, or shoal areas, where halibut and other groundfish are found, are limited to this narrow shelf which follows the fringe of the coast. These geographical differences between the two Coasts explain, to a considerable extent, the emphasis on groundfish exploitation in the Maritime Provinces while in British Columbia the important species are the salmons, caught in the upper water layers.

A Department of Fisheries map showing the fishing areas[1] and the most important fishing centers along the coast of British Columbia (Figure 1) reveals an extensive and deeply indented coastline with many inlets and river estuaries through which salmon travel on their way to the spawning grounds. Salmon fishing is carried on in all coastal waters between the Straits of Juan de Fuca in the south and Dixon Entrance in the north. For the fishing boats proceeding northward, it is possible, over most of the distance, to navigate along a protected inside route provided first, by the large land mass of Vancouver Island, and then by narrow inland channels such as Fisher, Finlayson and Grenville which form the so-called "inside passage" and extend toward Prince Rupert and Alaska. The outer island fringe and the deep coastal fjords were provided in the development of the Coastal Mountains. Including the many islands and deep inlets the Canadian Pacific coastline extends some 17,000 miles.

The geography of this coast has particular economic implications for the fishing of anadromous salmon.[2] The rivers, tributaries and inland lakes provide excellent propagation grounds for salmon. The protected navigational routes make it possible for small and relatively less expensive thirty to forty foot gillnet and troll boats,

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1 For the federal Department of Fisheries' administration, British Columbia is divided into three districts. The region adjacent to the coast has been further sub-divided into the 38 statistical areas shown in Figure 1.

2 Anadromous fish are those which spend the greater part of their lives in the sea but return to fresh water to spawn.

FIGURE 1

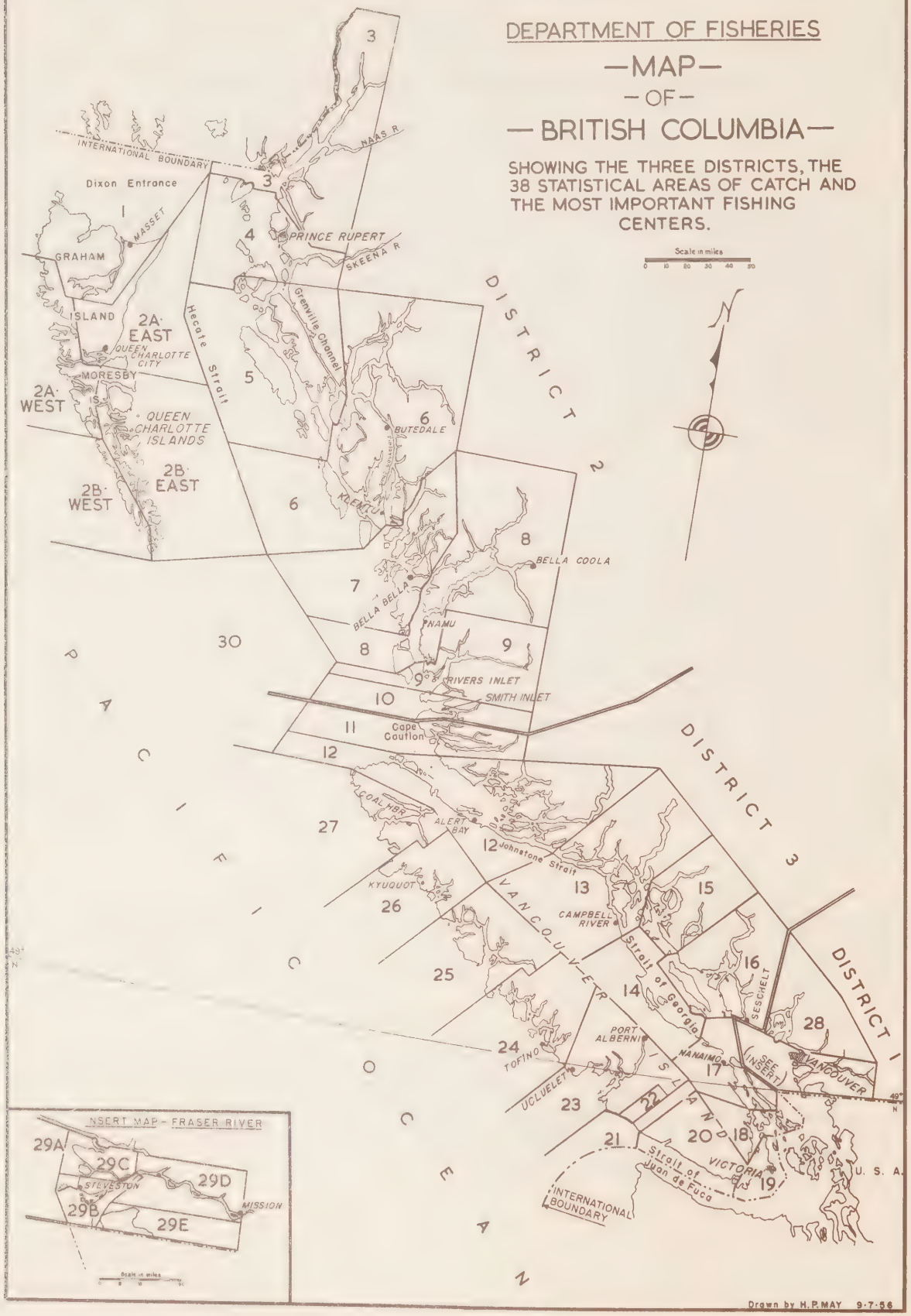
DEPARTMENT OF FISHERIES

—MAP—

—OF—

— BRITISH COLUMBIA—

SHOWING THE THREE DISTRICTS, THE 38 STATISTICAL AREAS OF CATCH AND THE MOST IMPORTANT FISHING CENTERS.



Drawn by H.P.MAY 9-7-56

as well as larger seine vessels, to navigate along a coast about 600 miles in length to fish in the most favourable areas as salmon make their annual appearance inshore. This mobility of the British Columbia fishing fleet over large areas is one of its most noticeable features. Fishermen range over the entire coast. With their radio telephones, they can keep in close contact with fishing conditions in various areas and take full advantage of unexpected runs that may develop.

2. Species of Pacific Salmon

To understand the fluctuations that occur in salmon landings from year to year it is necessary to know something about the life history of the various species of salmon. The five species caught in British Columbia are known in Canada as sockeye, pink, coho, chum and spring.[1] Each of these species is distinct in size, feeding habits and life cycle, as well as in commercial importance. All, however, have a common characteristic in that, once they have spawned, their life cycle is completed and they die. The steelhead catch is usually included with salmon statistics but steelhead is actually a species of trout which does not always die after spawning. The annual commercial landings of steelhead in 1953 and 1954 were only about half a million pounds, and therefore no special consideration has been given to this species in this report. A brief description of the five main species follows:

(a) Sockeye

Sockeye has been the most important of the commercial species.[2] It has extremely red flesh, high oil content and excellent canning qualities. Its life cycle is generally three to five years, and its mature weight five to eight pounds (average weight about seven pounds). Sockeye feed on plankton in the upper ocean layer and are normally caught by nets, either seine or gillnet. Like other Pacific salmon species, sockeye do not feed while en route to spawning grounds. The important sockeye spawning rivers are the Fraser, Skeena, Naas and the river systems emptying into Rivers and Smith Inlets. Sockeye are caught mainly from June to September 15. During the spawning migration, sockeye travel the farthest inland of all Pacific salmon species and their young remain in fresh water from one to two years. Due to the longer distances and higher elevations sockeye must overcome in their migrations, they are more seriously threatened by river obstructions such as rock slides or power and irrigation dams.

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1 Scientific names (in brackets) are: sockeye (Oncorhynchus nerka), pink (Oncorhynchus gorbuscha), coho (Oncorhynchus kisutch), chum (Oncorhynchus keta), spring (Oncorhynchus tshawytscha).

2 See value of salmon landings by species, Appendix B, Table A-12. In the eleven year period (1945 to 1955) sockeye landings averaged $5.8 million annually. During this same period the annual landings of chum averaged $3.9 million and landings of pink averaged $3.2 million.

(b) Pink

The pink species has light red flesh, turning pink when canned; it is delicate in flavour and has good canning qualities. Their life cycle is two years, and mature weight about four to seven pounds (average four to five pounds). The flesh is moderately firm and almost the entire catch is used for canning purposes. Pink salmon are caught mainly by gillnets and seines, although a small percentage are caught by troll fishermen with hook and line. Among the important characteristics of this species are the heavy runs in alternate years. In southern British Columbia waters, large pink runs occur in odd numbered years with almost none being reported in even years. In central and northern British Columbia the main runs are in even years, although in these areas there are runs in odd numbered years. Pink are caught mainly between July 15 and September 30.

(c) Chum

Chum are also referred to as Keta salmon. They have pink flesh which becomes pale when cooked, but they are also a good canning species. Their life cycle is three to five years, and mature weight eight to twenty pounds (average 10 to 12 pounds). Chum, like sockeye, feed on plankton in the surface waters and are caught by seines and gillnets. In northern areas, "early" chum are caught normally in the period from July to September while in southern areas the runs are from September to November.

(d) Coho

Coho are firm and red fleshed, with fair canning qualities. They are also sold on the fresh fish market. They have a three-year life cycle. Coho feed on other small fish during their last year and increase greatly in size. Their weight at the time of spawning ranges from five to fifteen pounds. However, during the summer before they have matured they are caught by troller fishermen in the inside waters of Vancouver Island and are known as "bluebacks" because of the bluish colour on their backs. Troller fishermen usually catch the largest percentage of coho but gillnet and seine fishermen also share in the commercial catch. Troller fishermen report bluebacks from June 1 on, but the main run of coho does not usually materialize until August. Most of the gillnet and seine catch is made after this date.

(e) Spring

Spring is the largest species of salmon, ranging in weight from five to sixty pounds or more. Their life cycle is four to six years. The flesh is firm and ranges from white to red in colour. Some spring salmon are canned but most are sold either fresh, mild-cured or processed otherwise. Spring feed extensively on smaller fish life while in salt water and because they will take the hook, the largest percentage of the commercial catch is taken by troller fishermen, gillnet fishermen taking most of the remainder. In 1953 and 1954 the annual seine landings were less than half a million pounds.

3. History and Importance of the Salmon Fishing Industry

Even before commercial salmon fishing became established in British Columbia, salmon was important as one of the main sources of food. The annual runs of salmon favoured the concentration of a large Indian population along the shores of salmon rivers. Salmon was also important to the early fur traders. The Hudson's Bay Company established trading posts at Fort Langley and Fort Simpson and began to barter for salmon as well as furs from the Indians. From 1835 to 1858, this company exported yearly to the Hawaiian Islands and Asia three to four thousand barrels of salt-cured salmon.[1] The gold rush to British Columbia in the late 1850's provided an important domestic market for dried salmon, but with the end of the gold rush it was necessary to return to export outlets. Commercial canning began on the Fraser River in 1870. It expanded rapidly. By 1875 the first cannery was established on the Skeena River. Canned salmon was found to be less perishable than the salted product. It could be shipped to distant markets by rail and water, and its high value relative to its weight enabled it to withstand heavy freight charges.

These first canneries were small and used hand-operated equipment. By the beginning of the twentieth century they were being mechanized. Automatic conveyor machinery and the salmon cutting and cleaning device known as the "Iron Chink" replaced the hand labour of Chinese, Indians, and other employees. For a period of years, the number of salmon canneries in operation continued to increase. By 1900, there were 65, and their number although fluctuating up and down, rose to a peak of 94 in 1917 but then declined rapidly to 27 in 1948.[2] During the 1954-55 season, only 20 canneries were in operation in British Columbia.

The rapid increase in plant mechanization after 1900 took place at the same time as the mechanization of the fishing fleet. Up to 1900, fishing boats did not have internal combustion engines. The drift gillnet was introduced on the Fraser in the 1870's but fishing boats were propelled by sail and oar until 1907.[3] In the 1920's the first diesel engines were introduced, leading to the development of the modern purse-seine fleet. The salmon purse-seine net was introduced in 1904 and was found to be very effective. Their number rose from 92 in 1912 to 445 in 1926.[4] This rapid

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1 W.A. Carrothers, The British Columbia Fisheries, University of Toronto Press, 1941, p. 5.

2 The Dominion Bureau of Statistics, Annual Fisheries Statistics, King's Printer, Ottawa.

3 W.A. Carrothers, The British Columbia Fisheries, University of Toronto Press, 1941, p. 59.

4 Op. cit., p. 42.

improvement in fishing equipment made it possible to extend operations over wider areas along the coast and, at the same time, the fleet was able to provide a greater supply of fish to plants located at central points.

In the initial stages of commercial salmon fishing the industry concentrated on the sockeye species. This is the fish on which the salmon canning industry was developed. However, in the early 1900's increasing proportions of coho, pink and chum were added to the canned salmon pack. From 1911 onward, pink and chum formed a large proportion of the total and during World War I these species began to account for well over half of the output (see Appendix B, Table A-10). The decline in Fraser River sockeye, due to rock obstructions and slides in 1913 and 1914 in the area of Hell's Gate Canyon, was another major factor contributing to the declining proportion of sockeye in the canned pack. With the rehabilitation of the Fraser salmon, following construction of the fishway at Hell's Gate in 1945, sockeye stocks have increased again; during the period 1951 to 1954, the annual pack of sockeye in British Columbia averaged over half a million cases[1] and made up 30 per cent of the total. The pack of all salmon increased significantly in the 1920's and remained at an average of 1.4 million to 1.8 million cases thereafter, with the exception of the depression years of 1931 to 1934 when the pack averaged less than 1.2 million cases per year.

The declining runs of sockeye salmon led to discussions between American and Canadian authorities, as salmon moving through the Strait of Juan de Fuca towards the Fraser River, are caught by both United States and Canadian fishermen. In 1930, a sockeye salmon convention was ratified by the two countries to ensure that fish runs in the Juan de Fuca - Fraser River areas would not become depleted. Under this convention the present "International Pacific Salmon Fisheries Commission" was established. It has the authority to make regulations concerning fishing seasons and fishing gear. It can also restrict fishing in areas which require extreme measures to conserve stocks of salmon. In December, 1956, an agreement was signed to extend the Pacific salmon convention and place pink salmon in the Juan de Fuca - Fraser River areas under joint management by the Pacific Salmon Commission.

In Canada, the Canadian Department of Fisheries carries out the regulations made by the Pacific Salmon Commission and also regulates the fishing of other salmon species caught by Canadian fishermen. It has legislative authority over, and administers, all tidal fisheries in British Columbia. In the salmon fishery, regulation to ensure an adequate spawning escapement is important. Because of the increasing efficiency of fishermen's equipment it has become necessary to enforce lengthened week-end closures, special closures and many other controls during the salmon seasons.

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1 One case equals 48 pounds net weight. On the average, 75 pounds of raw salmon (round weight) are required for one case of the canned product.

The three important commercial fisheries in British Columbia are the salmon, herring and halibut fisheries. During the seven years from 1949 to 1955 these three fisheries accounted for 90 per cent of the average value of all fish landings in the Province. Salmon alone accounted for over 66 per cent of this landed value (Table 1). Among other commercial fish, cod and other groundfish are not of much greater importance, in terms of landed value, than the shell fish such as crabs, oysters, shrimps and clams.

Table 1

Landed Values of Salmon, Herring, Halibut and All Other Fish, and Percentage Distribution, British Columbia, 1949-1955

Year	Salmon		Herring		Halibut		Other		Total	
	$'000	%	$'000	%	$'000	%	$'000	%	$'000	%
1949	15,632	57.4	4,173	15.3	2,785	10.2	4,661	17.1	27,251	100.0
1950	24,336	67.0	5,149	14.1	3,837	10.6	3,023	8.3	36,345	100.0
1951	28,396	69.9	5,597	13.8	3,511	8.6	3,134	7.7	40,638	100.0
1952	19,555	64.9	3,201	10.6	3,955	13.1	3,447	11.4	30,158	100.0
1953	21,848	68.7	3,678	11.6	3,661	11.5	2,594	8.2	31,781	100.0
1954	23,579	67.3	4,565	13.0	4,092	11.7	2,808	8.0	35,044	100.0
1955	18,481	65.2	4,187	14.8	2,648	9.4	3,014	10.6	28,330	100.0
Annual Average	21,689	66.1	4,364	13.3	3,499	10.7	3,240	9.9	32,792	100.0

Source: British Columbia Catch Statistics, Canada Department of Fisheries, Vancouver, B.C., 1949-1955.

In British Columbia, fishing is the fourth largest primary industry and is exceeded by forestry, agriculture and mining. On the basis of net value of production,

after deducting the cost of materials and supplies used, it is estimated that the British Columbia primary fisheries now account for between two and three per cent of the output of all industries in the province.[1]

4. Methods and Organization of Fishing

There are three main methods of salmon fishing in British Columbia: gillnetting, trolling and seining. The method of fishing (or type of gear) is used to designate the three important groups of salmon fishermen, who are known as gillnetters, trollers and seiners. Gillnet gear is used to equip the largest number of the boats used in salmon fishing, followed in order by troll and seine gear. In 1953, 4,660 fishermen obtained gillnet licences, compared with 4,224 troll and 2,860 licences covering seine fishermen. A description of these three methods of fishing follows:

(a) Gillnet

Gillnets snare salmon by the gills. This gear has been used since the beginning of factory canning of salmon in British Columbia. At first the nets were operated entirely from sail and row boats and were hauled by hand; but today practically all of the boats are power-driven and the net is hauled by a large revolving drum which is also power-driven.

The size of the gillnet mesh varies considerably depending on the size of the salmon to be caught. The nets are either linen or nylon, with the latter becoming of increasing importance because of its efficiency and lasting qualities. The twine used in the nets is fine, but strong. The net is hung from a cork line at the surface and weighted down by a lead line which runs along the bottom of the net. A buoy is attached to one end, and the net is set out by travelling at slow speed while the net is unwinding from the drum. The boat and net then drift with the tide or current until the net is hauled. Gillnets, although varying from 150 to 300 fathoms, are most commonly 200 fathoms (1,200 feet) in length, when hung from the cork line ready for fishing. The depth varies according to the size and number of meshes. The 60 mesh net has been permitted in most areas, and in 1954 permission was given to use this depth in Rivers and Smith Inlets where previously only 50 mesh nets had been allowed. With this number of meshes a net with a six inch mesh would fish a depth of four to five fathoms.

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1 This is based on a recent Dominion Bureau of Statistics survey of the net value of production, by industries, in British Columbia. Comparative figures for the years 1952 to 1954 are given in Appendix B, Table A-16.

Gillnet boats average about 31 or 32 feet in overall length and are normally powered by marine gasoline engines of 100 to 130 horsepower. Very few diesel engines are used. In recent years many of the larger boats have been fitted for halibut long-line fishing during a three or four-week period before the salmon season begins. A number of gillnet boats, particularly those from the "lower mainland" area around Steveston, also trawl for shrimp. Most of the gillnet boats are owned by fishermen, although in the northern areas of the province some of the boats are owned by fish processing companies and rented to fishermen on a seasonal basis. Most gillnet boats are manned by a single person who can haul the net and steer the boat by means of auxiliary controls. It is not unusual, however, for the fisherman to be accompanied by his wife, or a son who is learning to fish.

Figure 2. Salmon Gillnet Boat

In addition to those gillnet fishermen who are dependent on the salmon fishery as a major source of income, there are some part-time fishermen who restrict their activities to holidays and evening fishing, generally in areas close to their homes.

(b) Troll

Trolling is the hook and line method of fishing. The troller fishermen use four to eight stainless steel lines operated from the boats by powered gurdies. Artificial bait with metal flashers, plugs and spoons are used to lure the fish. The troll lines are normally 50 fathoms in length. Gear entanglement is avoided by suspending the lines from four long poles and by the use of various sized lead weights and bladder floats. Lines from the bow poles are fished the deepest - from about 25 to 40 fathoms - while lines from the main poles are fished at about 15 to 25 fathoms. A troll boat equipped with six lines will fish about 18 hooks for spring salmon and about 36 hooks for coho. In recent years, stabilizing vanes (small floats) have been attached to the main poles and when the poles are let down for fishing these run in the water on both sides of the boat, reducing boat-roll. When the lines are set, troll boats maintain a slow forward speed of three or four knots.

Figure 3. Small Salmon Troller Boat

Troll boats are less uniform in size than gillnet boats, ranging from less than 30 feet to over 40 feet in length. Most of them are powered by marine gasoline engines similar to those used on gillnet boats but some of the largest are powered by diesel engines.

Commercial trollers consist of two main types: those that operate from a home base and deliver their fish each day, and those that carry ice to preserve fish and are able to remain on the fishing grounds up to eight days. These ice carrying trollers are manned by either one or two fishermen and, in the event of an assistant going along, the net earnings (i.e., gross receipts, less expenses for fuel, gear and food) are usually divided three ways with one share going to the owner of the boat, one to the captain and one to the assistant. In the fall salmon season, many of the larger boats have seine tables which can be mounted on the stern to enable them to seine local runs of migrating chum. The larger boats are also used to fish halibut.

Although the trollers are the second largest group of salmon fishermen, their catch is third in order of importance and in the five-year period (1951-1955) they averaged only 14 per cent of salmon landings (Table 2). The main trolling areas are on the offshore waters adjoining Vancouver Island and the Queen Charlotte Islands.

In contrast to the seine and gillnet fishermen who normally sell their salmon in the round, trollers usually clean their fish and sell them in the dressed, head-on form.

(c) Seine

In seine fishing the purse-seine is the type of gear used. It is a heavy cotton twine net supported at the surface by cork or plastic floats. The purse line runs through large metal rings attached to bridles from the lead line at the bottom of the seine. During the fishing operation, one end of the seine is taken on board a seine skiff while the seine boat runs out the net and encircles the fish. Once this is done the purse line is drawn in to enclose the fish and prevent them from sounding and escaping. The net is then hauled on the seine table until there is only a small circle of it beside the seine boat. The salmon can then be brailed into the hold of the boat with a large power dip net called a brailer. The seine was normally hauled by hand and the average seine-set took about 45 minutes. In 1955 a number of seine boats began to use a power-operated block which can haul the seine more quickly. In certain offshore waters, and in the Strait of Juan de Fuca, fishermen are permitted to use seines up to 375 fathoms in length. The size of net normally used in the inshore waters is 200 to 250 fathoms in length. The seine depth varies but usually it includes three or four strips of netting, with 100 meshes to the strip. Four and a quarter inch mesh is the size most commonly used.

Figure 4. Purse-Seine Vessel (Table Type)
Equipped with Hydraulic Block

Figure 5. Purse-Seine Vessel (Drum Type)

Two types of seine boats are used in salmon fishing. The table-seiner is the traditional type and represents the largest number of seiners in operation. On this type, the net is hauled and stored on a seine turn-table mounted on the stern of the boat. In recent years a second type, the drum-seiner, has become increasingly important. With this type of boat the net is hauled by a large power-operated drum similar to that used on gillnet boats.

The salmon purse-seine fleet in British Columbia now consists of 450 to 500 vessels ranging from 40 to 85 feet in overall length. These vessels are powered predominantly by diesel engines of 60 to over 200 horsepower. The crew varies from four men on drum-seiners to six or eight on table-seiners. All salmon seining is on a share basis with the crew, including the captain, receiving seven-elevenths of the value of the catch after deducting the fuel cost. The remaining four-elevenths is allocated to the owner of the boat and seine net. While the majority of seine boats are able to fish in most areas of the province, only the larger vessels can fish successfully in such outside waters as the Straits of Juan de Fuca and Vancouver Island's west coast. These vessels range from 60 to 85 feet in overall length, and from about 50 to 90 tons (registered net tonnage). Most of the larger salmon seine vessels are also engaged in the herring fishery, and a few of both the large and small seiners also fish halibut.

During recent years there has been a trend towards increased use of navigation and communication aids such as echo sounders, direction finders, automatic pilots and radio telephones. All three types of fishermen - gillnetters, trollers and seiners - have been adding the most modern aids to their boats. In addition, there has been a trend toward larger gillnet boats which may also be fitted for salmon trolling and long-lining for halibut. Modern salmon seiners are being built so that they may be adapted to herring and halibut fishing. At the present, most of the British Columbia fishermen are well equipped, relative to Canadian fishermen in general, in terms of boats and fishing gear.

(d) Salmon Catch by Different Types of Gear

In the period 1951 to 1955, seine fishermen caught the largest volume of salmon, followed closely by gillnet fishermen who took over 40 per cent of the catch (Table 2). A small quantity of salmon was caught in traps but these were few in number and of relatively minor importance.

Although seine fishermen have taken a slightly larger quantity of salmon, gillnetters have accounted for higher values in landings. This is due to a larger proportion of sockeye in gillnet landings. In 1954, gillnet total landings were estimated at $10.6 million, seine landings at $9.1 million and troll landings at $2.5 million.

Table 2

Salmon Landings by Type of Gear, British Columbia, 1951-1955

Year	Seine		Gillnet		Troll		Trap		Total	
	Million Pounds	Per Cent	Million Pounds	Per Cent	Million Pounds	Per Cent	Million Pounds	Per Cent	Million Pounds	Per Cent
1951	89.4	44.3	81.7	40.5	29.2	14.5	1.5	.7	201.8	100.0
1952	57.1	37.8	65.2	43.1	27.8	18.4	1.0	.7	151.1	100.0
1953	86.9	45.5	76.6	40.2	25.9	13.6	1.4	.7	190.8	100.0
1954	84.0	46.2	77.1	42.3	20.3	11.2	.5	.3	181.9	100.0
1955	58.0	43.1	52.2	38.8	22.9	17.1	1.3	1.0	134.4	100.0
Annual Average	75.1	43.7	70.6	41.0	25.2	14.7	1.1	.6	172.0	100.0

Source: British Columbia Catch Statistics, Canada Department of Fisheries, Vancouver, B.C., 1951-1955.

Note: All landings are listed on a round weight basis.

One of the most important differences among the three types of salmon fishermen is their reliance on different species of salmon. Gillnetters derive the major portion of their income from sockeye. In 1953 and 1954, sockeye accounted for nearly 60 per cent of the total value of salmon taken by gillnet gear. In the same years, between 90 and 95 per cent of the total value of troll landings were from spring and coho. Seine fishermen however, are not as dependent on one or two species. They catch more pink and chum than the other fishermen and they also catch a large proportion of sockeye. The adaptability of seine gear enables these fishermen to take greater advantage of peak runs of most species. This may be illustrated by a comparison of seine landings in 1953 and 1954. In 1953, pink salmon accounted for 44 per cent of the total value of the seine catch, chum provided 28 per cent, sockeye 22 per cent and other salmon species 6 per cent. In 1954, seine fishermen took advantage of the peak sockeye year and sockeye accounted for 45 per cent of the total value of their catch while chum made up 35 per cent and pink only 14.5 per cent.

(e) Fish Collection

When commercial salmon fishing first began in British Columbia, fishermen made their catch near the canneries. With the introduction of gasoline and diesel engines, larger boats were built and fishermen travelled over much more extensive areas. This enabled a greater concentration of the processing industry. The number of canneries decreased and larger plants were located at central points along the coast. The use of "packer" boats, to transport salmon from the fishing grounds to the canneries, made it possible for fishermen to remain on the grounds longer with a minimum of ice. The packers pick up the salmon daily, especially from gillnetters and seiners which are congregated in inshore areas.

Crews on packers, or "tendermen" as they are known to the fishing industry, are employed by fish processing companies on a wage basis. The packing boats may be owned by companies or chartered from private owners. In 1954, there were around 260 fish packing and collecting boats transporting salmon and other fish, with about 1,000 men employed as tendermen.

5. Fishermen and Processor Associations

The first fishermen's organization in British Columbia was the Fraser River Fishermen's Benevolent Association, formed in 1893. From this early beginning, fishermen have followed a more consistent pattern of unionism than the farmers in British Columbia,[1] or fishermen and farmers in other provinces. Most fishermen operate independently, however, selling their fish to the companies at or above the minimum prices negotiated by the fishermen's union with the fish processors. Price negotiations begin early in the year, in an effort to reach agreement before the fishing season commences. The negotiated prices apply only to gillnet and seine salmon. There are, at present, no price agreements for salmon caught by troller fishermen, who sell their fish at the prevailing market price. The price of troll salmon is, however, influenced by the prices paid to gillnet and seine fishermen, as well as the market prices in Seattle, the nearest United States fresh fish market.

These negotiated prices form only one part of the union-processor contract which covers such other aspects of fishing operations as contributions to a welfare fund, minimum crew members, wages for tendermen and for employees in fish processing plants.

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1 Stuart Jamieson and Percy Gladstone, Unionism in the Fishing Industry of British Columbia, Canadian Journal of Economics and Political Science, Toronto, February 1950, Vol. 16, p. 2.

British Columbia fishermen are represented by the United Fishermen and Allied Workers Union, the Vessel Owners' Association, and the Native Brotherhood of British Columbia, the latter union representing the Indian fishermen. The fish processors are represented by the Fisheries Association of British Columbia which has a membership comprising all major processing companies.

There are also several fishermen's co-operatives in British Columbia, of which the largest is the Prince Rupert Fishermen's Co-operative Association. This co-operative was incorporated as a fish collecting organization in 1931. It began buying halibut in Prince Rupert in 1941 and now buys salmon and other fish and engages in fish processing and herring reduction. In addition to co-operatives, there are a number of fishermen's credit unions and a fishermen's marine insurance company.

6. Production and Supply of Pacific Salmon in Canada and Other Countries

The landings of salmon from the Pacific Ocean constitute at least 85 per cent of total world supply, and they are the major source of the canned salmon product. The four important salmon producing and exporting countries are the United States, Canada, Japan and Russia. Pacific salmon habitats are the temperate and sub-arctic waters of the North Pacific from Monterey Bay, California, to Alaska and southward along Siberia to Japan.[1] A relatively few regions, however, provide the important supplies of particular species. The Fraser River in British Columbia and Bristol Bay in Alaska are noted for sockeye, with the Fraser, because of its numerous tributaries and lakes, being the most productive sockeye river in the world. The total productive lake area in this river system is about 960 square miles, more than twice the combined area of all the other sockeye lakes of British Columbia.

In recent years, the total landings of Pacific salmon have been in the vicinity of 600 to 700 million pounds (Table 3), though statistics of landings made by the U.S.S.R. were not included in the total until 1954. Canadian fishermen have landed one-fifth to one-quarter of this total. The United States is one of the largest salmon producing countries but an increasing proportion of its production is consumed domestically with a consequent decline in exports. On the other hand, Japan and Soviet Russia are exporting an increasing volume.

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1 Jozo Tomasevich, International Agreements on Conservation of Marine Resources, Food Research Institute, Stanford University Press, California, U.S.A., 1943, p. 222.

Table 3

Annual Salmon Landings, Total Pacific and British Columbia, 1947-1954

Landings in	1947	1948	1949	1950	1951	1952	1953	1954
	(Landed weight in millions of pounds)							
Total Pacific	688	569	655	549	628	582	564	675
British Columbia	162	145	147	185	198	147	187	179
British Columbia as per cent of Total Pacific	24	25	22	34	32	25	33	27

Source: Food and Agriculture Organization, Yearbook of Fisheries Statistics, Rome, 1955, p. 14.

With proper management, the prospective supply of all salmon species from the Canadian Pacific Coast appears favourable. The rehabilitation of the Fraser River sockeye seems assured, although the most recent production in this area is still only 56 per cent of the peak cycle years from 1910 to 1913.[1] In the Skeena and Naas River systems, declining sockeye runs have been a matter of concern in recent years. In 1951, a rock-slide on the Babine River, a tributary of the Skeena, threatened to destroy an important sockeye population but this obstruction was removed by the Department of Fisheries in 1953. In 1954, the Fisheries Department established a management committee to work towards the rehabilitation of the Skeena River salmon fisheries.

7. Markets

British Columbia salmon is marketed mainly in the canned state, with the balance sold principally in the fresh or frozen and mild-cured forms. Canned salmon from British Columbia is well known in world markets, sockeye being the most famous

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1 The Fisheries Research Board of Canada estimates that adequate management measures can restore most of the Fraser sockeye stocks to their maximum yield within the next 12 years. See The Commercial Fisheries of Canada, p. 19 Manuscript report prepared by the Canadian Department of Fisheries and soon to be published by the Royal Commission on Canada's Economic Prospects.

species because of its red flesh and rich oil content. British Columbia salmon also enjoys a strong demand in the Canadian market, which took over 50 per cent of the total quantity canned in the years 1949 to 1954, inclusive. The pack in the above six-year period totalled 9.8 million cases. Of this amount, 4.5 million cases were exported and 5.3 million cases were consumed in Canada.[1]

The United Kingdom has been the most important single export market for this canned salmon. During the five years, 1949-53, the United Kingdom bought a total of 1.3 million cases, or about 35 per cent of all exports. The balance goes chiefly to the Netherlands, Italy, France, Belgium, Australia, New Zealand and the United States.

Since the end of World War II, packaged frozen fish in fillets and other forms has become increasingly popular and the amount of salmon sold in these forms has increased greatly and remained at a relatively high level. Fresh and frozen salmon are marketed almost entirely in Canada and the United States. On a value basis, salmon marketed in other than the canned form totalled over $74 million, or about 26 per cent of the market value of all British Columbia salmon, in the six years 1949-54 (See Appendix B, Table A-11). In export markets, salmon sold in other than the canned form totalled over $50 million and represented about 38 per cent of the total value of salmon exported during this same period.

Imports of canned salmon by such countries as the United States, the United Kingdom and Western Europe, are subject to government controls such as import tariffs and import quotas. A further and major obstacle at present is the dollar shortage in some traditional markets. This problem is particularly apparent in the United Kingdom where, although there is no tariff on Canadian canned salmon, purchases have been limited to about 250,000 cases per year since 1949. With favourable trade conditions, it has been estimated that this market might consume, in total, up to three million cases each year.[2]

With an increasing population in Canada, it seems likely that a larger proportion of all salmon products will be sold in domestic markets. This growing outlet should compensate, in considerable measure, for continuing difficulties in export markets.

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1 Data from Summary Statistics of Canada's Fisheries, Department of Fisheries, Economics Service, Ottawa, 1935-1954.

2 The Fisheries Association of British Columbia, Submission to the Royal Commission on Canada's Economic Prospects, November 1955, p. X.

8. Prices Received by Salmon Fishermen

As stated above, fishermen and processor associations negotiate minimum prices for all species of salmon caught by gillnet and seine fishermen. British Columbia fishermen have sold their salmon production on this basis for many years. In accepting stable season prices fishermen feel they have achieved one constant factor in the group of unknowns they must face in fishing operations. Beginning in 1955, minimum prices have been set for two-year periods, thus providing further price stability.

In the 1954 season, salmon fishermen received an average of 13.2 cents for all species of salmon caught (Appendix B, Table A-14). In a comparison of indices of prices paid to fishermen in 1954, relative to average prices paid during the period 1935 to 1939, this price made the price index of British Columbia salmon second to the highest of all major Canadian species. These price indices were as follows:

Index of Prices to Fishermen[1], 1954

Species	Price relative to 1935-39 average (Per cent)
Herring, B.C.	525.0
Salmon, B.C.	398.2
Salmon, Maritimes and Quebec	342.8
Lobsters	327.7
Mackerel	309.3
Pickerel (yellow)	283.6
Halibut, M. and Q.	264.1
Cod	250.0
Haddock	247.6
Whitefish	232.7
Herring, M. and Q.	225.0
Flatfish, M. and Q.	212.4
Halibut, B.C.	210.1
Lingcod	153.3
Lake Trout	140.4
(Index of general wholesale prices, Canada)	(217.0)

1 Prices to fishermen refer to average annual prices calculated by dividing total landed value by landed weight.

With the exception of the 11.7 cents per pound received in 1953, annual prices during 1950 to 1955 were either equal to or greater than the average of 13.2 cents obtained in 1954. Thus, in recent years salmon fishermen have received relatively high prices.

Although minimum prices are agreed upon at the beginning of the fishing season, the prices of salmon may go above the minimum as the season progresses. A comparison of minimum prices with average annual prices paid during the eleven-year period of 1945 to 1955 reveals that the most significant increases occurred in prices for coho and spring salmon. For sockeye, minimum prices were within half a cent of the average prices paid through each year, with the exception of 1948, when the average price was 2 1/2 cents above the minimum contract price.[1] Contract and average prices for pink were also very similar during this period, but during the four years through 1948 to 1951, average prices for chum were as much as 4 cents above the minimum prices.[2] The significant differences in minimum and average prices for coho and spring salmon occur because of the attractive prices for these species in the fresh fish market. A large proportion of the troll fishermen's catch of coho and spring goes to the Seattle market.

The species of salmon caught in largest quantities are chum, pink and sockeye. Fishermen have been receiving about three times as much per pound for sockeye as for chum and pink. Because of this price disparity, a decline or increase in the annual catch of sockeye can have a major effect on fishermen's incomes.

9. Value of Capital in the Industry

In the primary fishing industry in British Columbia the amount of capital employed in relation to labour is generally higher than the capital employed in sea fisheries elsewhere in Canada.[3] The aggregate of capital used in the primary fishery, by both fishermen and fish processing companies, in British Columbia now totals over $51 million (Table 4). Fishing boats account for over $40 million and the remainder

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1 In 1956 also, while the minimum price for sockeye was 24 cents, most companies paid 28 cents to 30 cents.

2 These salmon prices are included in Tables A-13 and A-14, Appendix B.

3 The number of fishermen operating in the Atlantic sea fisheries, including the Maritime Provinces, Quebec and Newfoundland, is approximately four times the number in British Columbia; but the capital used in the British Columbia fisheries is nearly equal in value to that of the Atlantic fisheries. Fisheries Statistics of Canada for 1954 lists the value of capital for the Atlantic region at $57 million and that for British Columbia at $51 million.

Table 4

Estimated Value of Capital in the Primary Fishery, British Columbia, 1953 and 1954

	1953		1954	
	No.	Value $'000	No.	Value $'000
Gasoline boats:				
Under 10 tons	6,799	19,346	6,774	17,628
10 tons and over	165	1,982	176	2,088
Diesel boats:				
Under 10 tons	124	1,221	110	882
10 tons and over*	722	22,506	739	22,652
Row boats and canoes	661	65	661	68
Landing barges	3	54	3	50
Fishing gear	-	5,893	-	6,053
Shore equipment	-	1,800	-	1,722
Total	8,474	52,867	8,463	51,143

Source: British Columbia Fisheries Statistics, Canada Department of Fisheries, 1953 and 1954.

* Includes 4 steam vessels in both years, valued in total at $500,000 in 1954. The boats are grouped on a registered net tonnage basis.

is provided by fishing gear and shore equipment. It is not possible to separate the capital value of boats and equipment used in the salmon fishery from the capital equipment used in herring, halibut and other fisheries because many of the boats are used in several different fishing operations. Similarly, a number of the boats are used both in fishing and for collecting and packing fish. In the salmon fishery in 1954, there were about 3,700 gillnet boats, over 2,900 troll boats, about 400 combination troll and gillnet boats and 500 seiners. The salmon fishing gear for these boats was valued at $4.4 million in 1954, and thus accounted for over two-thirds of the total capital value of all types of fishing gear.

In the secondary industry, salmon canneries constitute the highest proportion of capital invested in processing firms in British Columbia. In 1945, for example, they accounted for over $12 million or about 65 per cent of total fixed capital estimated at $18.9 million.[1] In January 1956, a survey of capital investment in fish processing in British Columbia showed a fixed asset investment of approximately $43 million. This figure needs to be corrected for the value of primary industry fishing boats and equipment included by a few of the processing companies.

10. Employment in the Industry

In British Columbia, the primary fishery provided seasonal employment for an estimated total of 12,000 fishermen in 1953 and 1954. Many of these fishermen are licensed to fish other species but most of them are salmon fishermen. In 1953 there were 11,744 commercial salmon fishermen licensed. A number of the fishermen interviewed during this survey were also employed for part of the year in collecting and packing fish or in fish processing plants. In this manner, fishermen who do not participate in all of the major fisheries each year are often able to find employment in the off-season period for salmon fishing. Members of fishermen's families also work in canning and other processing plants. In 1953, 3,400 salaried employees and wage earners were employed in processing plants.[2]

Because fishing is seasonal, employment opportunities in the fishery must be related to complementary employment existing in other industries. Furthermore, because wages and employment conditions are very favourable in most other industries in British Columbia, fishing must yield a reasonably comparable income. In 1952 and 1953, British Columbia manufacturing industries paid average annual wages of $2,975 and $3,108, respectively. These were higher than average wages paid in any other Canadian province, and were about $300 above the averages for Canada as a whole.[3] With its rapid development of provincial resources it is likely that such other industries in British Columbia will continue to offer strong competition to the fisheries in terms of employment opportunities.

11. British Columbia Salmon Landings in 1953 and 1954

(a) Total Quantity and Value of Landings

A summary of the statistics on salmon landings and prices for all British Columbia in 1953 and 1954 provides a useful background for the study, below, of

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1 Dominion Bureau of Statistics, Fisheries Statistics of Canada, 1945, p. 45.
2 Dominion Bureau of Statistics, The Fish Processing Industry, Ottawa, 1953, p. D-10.
3 Dominion Bureau of Statistics, Canada Year Book, Ottawa, 1955, p. 669, 1956, p. 656.

fishermen's incomes and operations in these two years. These statistics show the areas in which salmon are caught, and also provide a breakdown of landings for the different types of fishing gear used.[1]

The volume of salmon caught in 1954 was 4.7 per cent below the previous year, falling from 190.8 million pounds in 1953 to 181.9 million pounds in 1954 (Table 5). But while the volume declined, the value of salmon increased by

Table 5

Total Salmon Catch by Species, British Columbia, 1953 and 1954

Species	1953		1954	
	Volume	Value	Volume	Value
	Million Pounds	$'000	Million Pounds	$'000
Sockeye	35.3	7,788	47.0	10,398
Chum	54.4	3,782	74.4	5,453
Pink	61.7	4,509	25.8	1,996
Coho	23.2	2,939	20.7	3,133
Red Spring	10.8	2,198	8.8	1,983
White Spring	4.6	538	4.3	514
Steelhead	0.5	59	0.5	79
Jack Spring	0.3	35	0.4	23
Total	190.8	21.848	181.9	23,579

Source: British Columbia Catch Statistics, Canada Department of Fisheries, Vancouver, B.C., 1953-1954.

Note: The volume is given in the round weight form.

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1 The Economics Service of the Department of Fisheries at Vancouver provides these statistics by a detailed analysis of fish sales known as the sales slip system. Many of the data used in this report have been derived from this source.

almost 8 per cent, from $21.8 million to $23.6 million. This increase in value can be attributed largely to a change in the composition of the catch- that is. to an increase of one-third in the catch of high-valued sockeye. A rise of almost 40 per cent in the chum catch was more than offset by the fall in volume of pink. This change in the volumes of different species caught could be considered as the major factor responsible for the increase in salmon fishermen's incomes in 1954.

Another important contributing factor was the price of salmon. In 1954, prices to fishermen either remained steady or rose moderately over those of the previous year. The 1953 price of 22 cents a pound for sockeye was maintained through 1954. For coho and red spring, prices increased from 11 to 13 cents. For pink they rose from 7 1/4 to 7 3/4 cents and for summer chum, prices were up to 6 1/4 cents as against 5 1/2 cents in 1953, while fall chum rose from 8 cents to as high as 12 cents in 1954.

Thus, as a result of an increase in the proportion of sockeye and chum and a somewhat higher price for salmon species, other than sockeye, the smaller overall catch in 1954 yielded more income to salmon fishermen than the 1953 catch. The value of the 1954 catch was the third highest in history, exceeded only by the 1950 and 1951 catches valued at $24.3 million and $28.4 million, respectively. The record value of salmon landings in 1951 resulted from higher salmon prices, for that year, combined with the largest catch in recent years.[1]

(b) Landings by Area

The value of landings within the three fisheries districts[2] in British Columbia do not necessarily reflect the incomes of fishermen living in these districts. With the intense competition for salmon, fishermen have travelled increasingly each year and there is a tendency for full-time fishermen to fish in all three districts of the province. However, there is still a considerable number of fishermen who are restricted in their operations and must rely on salmon runs in particular areas. This difference in extent of travel is one of the factors that causes differences in incomes.

In District 2, the landed value of salmon in 1953 and 1954 was in each year about 13 per cent below the average landings reported in the seven years from 1949 to 1955 (Table 6). In District 3, the landed values were considerably above average in both 1953 and 1954, while in District 1 the well known sockeye run to the Adams River, a tributary of the Fraser, helped to increase the 1954 value of salmon to nearly 50 per cent above the annual average for these seven years.

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1 See Appendix B, Table A-12, Salmon Landings and Value, 1945 to 1955.
2 Districts are Department of Fisheries statistical districts, shown in Figure 1.

Table 6

Landed Value of Salmon by Districts, British Columbia, 1949-1955

Year	District 1	District 2	District 3	Total
	$'000	$'000	$'000	$'000
1949	2,469	6,131	7,032	15,632
1950	3,014	10,050	11,272	24,336
1951	3,776	12,911	11,709	28,396
1952	2,863	10,193	6,499	19,555
1953	3,317	7,523	11,008	21,848
1954	4,726	7,545	11,308	23,579
1955	2,000	6,388	10,093	18,481
Annual Average	3,166	8,677	9,846	21,689

Source: British Columbia Catch Statistics, Canada Department of Fisheries, Vancouver, B.C., 1949-1955.

On the basis of total landed values, it can be assumed that fishermen who operated in all three districts would have average incomes in 1953 and 1954, because the value of landings in each of these years was closer to the annual average than it was in any other year from 1949 to 1955. On a similar basis, fishermen who restricted their operations to District 2 would probably have lower than average incomes, while those restricted to Districts 3 and 1 would have above average incomes.[1] Considering the landed values for all districts, however, it

1 Variations in fishermen's incomes which are due to location of fishing were an important consideration in this study. The sample of fishermen was designed to obtain, as nearly as possible, representation in accordance with the population of fishermen in the three districts. See Appendix D, Size and Representativeness of Survey Samples.

seems clear that 1953 and 1954 were relatively normal salmon years and therefore an income survey in these years should provide data that are representative of incomes over a longer period. As the five Pacific salmon species have life cycles ranging from two years to six, it will be noted that the above comparison of landed values over a seven-year period covers at least one complete life cycle for each salmon species, and therefore it includes both peak and smaller salmon crop years.

PART 11

PART II

SURVEY ANALYSIS OF SALMON FISHERMEN'S OPERATIONS AND INCOMES IN 1953 AND 1954

1. Introduction

This section examines the annual incomes, from all sources, of salmon fishermen for 1953 and 1954 and the more important factors which affect the level of their incomes. These factors include the value of fishing capital owned, boat size, and length of fishing time.

Due to the wide variety of boats and fishing gear used, there are many different aspects which require examination. For example, fishing accounts of receipts and expenditures vary and are necessarily more complex for crew settlements in purse-seine fishing than for single operators on gillnet and troll boats. For this reason, more explanation is provided on seine captains' and seine assistants' operations than on those of gillnet and troll fishermen.[1]

To make a direct comparison of the main types of fishermen's operations and incomes, the fishermen interviewed have been treated on an individual basis. Shared crew accounts for salmon seining and other fishing have been separated and only those items credited to the fisherman interviewed have been retained in this comparison. Fishing capital was treated in a similar manner and only capital owned by the individual interviewed is shown.

2. Summary of 1953 and 1954 Survey Data on Salmon Fishermen's Incomes

As an introduction to the detailed analysis which follows, the more general findings of this income study are given here in summary form, together with data on fish receipts, fishing costs, and resulting net incomes. All major items, such as the number of days fished, boat size, and value of fishing boats and equipment are given in average figures for each group of fishermen interviewed. As stated in the introduction to this report, the data were gathered from the 172 salmon fishermen who furnished information on their activities in both 1953 and 1954.

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1 Although only a brief explanation of crew settlements and the method of treating these are provided in this section, Appendix A outlines fully the manner in which such accounts have been handled and Appendix B gives examples of various types of crew settlements.

Table 7

Summary of the Operations of 172 Salmon Fishermen,[1] Averages by Four Main Types of Fishermen, British Columbia, 1953 and 1954

Item	Unit	Gillnetters		Trollers		Seine Assistants		Seine Captain	
		1953	1954	1953	1954	1953	1954	1953	1954
No. of fishermen	number	64	64	51	51	32	32	25	25
Days engaged in fishing									
Operations	days	166	173	174	166	130	126	175	182
Afloat	days	80	83	98	87	74	71	98	86
Length of boat (overall)	feet	30	31	34	34	55	54	55	55
Fishing capital	dollars	3,825	3,608	5,152	5,015	738	682	16,283	17,840
Total cash operating receipts[2]	"	3,239	3,499	2,910	2,755	2,618	3,018	8,941	9,832
Total cash operating expenses[3]	"	-1,422	-1,446	- 975	- 908	- 300	- 334	-3,027	-3,058
Net cash operating receipts	"	1,817	2,053	1,935	1,847	2,318	2,684	5,914	6,774
Non-fishery income[4]	"	≠ 839	≠ 755	≠ 598	≠ 590	≠ 758	≠ 718	≠ 523	≠ 529
Total net cash income	"	2,656	2,808	2,533	2,437	3,076	3,402	6,437	7,303
Depreciation on fishing capital	"	- 220	- 212	- 336	- 334	- 47	- 48	- 867	- 923
Net income less depreciation	"	2,436	2,596	2,197	2,103	3,029	3,354	5,570	6,380

1/ Records were taken from the same individual fishermen in both 1953 and 1954.
2/ Includes the gross value of salmon and other fish receipts, charters and fish packing receipts.
3/ Includes all operating costs, annual insurance and interest payments.
4/ Includes the total of net income from other occupations and sources outside the fishing industry.

The average incomes of the four types of salmon fishermen differed considerably. Troller fishermen showed the lowest incomes, exceeded, in ascending order, by gillnetters, seine assistants and seine captains. With their net cash income from fisheries averaging over $6,000 per year, seine captains reported incomes which averaged nearly three times as high as those of troller fishermen (Table 7). These income differences between types of fishermen are significant when it is considered that all four types averaged nearly the same amount of time spent afloat. Seine assistants reported less fishing time than other fishermen, but the average fishing time was lower for this group because about one-quarter of the seine assistants were part-time crew members.

The primary reasons for the differences in income among these groups of salmon fishermen are the different fishing methods and the variations in size and value of boats and fishing gear used. Seine captains operated boats of 55 feet in length and owned capital equipment valued, on the average, at over $16,000. Gillnet and troller fishermen operated with boats of 30 and 34 feet in average length and owned fishing capital averaging $3,700 and over $5,000, respectively.[1]

With the averages based on records from the same fishermen for both years, it is apparent that the fishing receipts for all groups of fishermen except trollers increased substantially in 1954. Expenses changed very little from the 1953 averages, with the result that all salmon fishermen except trollers showed an increase in net receipts (see net cash operating receipts, Table 7).

Non-fishery income, earned from other occupations or received from any source outside the fishing industry, declined among gillnetters and seine assistants in 1954, but remained at the same level among trollers and seine captains. For all except troll fishermen, the declines in non-fishery incomes were more than offset by increases in fishery receipts.

After adding net fishing receipts to net receipts from other sources, the total net cash income increased by an average of $152 over 1953 for the sample of gillnet fishermen. Seine assistants reported an average increase of $326, and seine captains an increase of $866. Trollers, on the other hand, showed a decline of $96 per fisherman.

The depreciation allowance for fishing capital remains relatively fixed from one year to the next, and therefore it has not been a significant factor in the income

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1 Details on the relation of capital equipment, fishing time, etc., to fishermen's incomes are found later in this report.

changes which occurred in this two-year period. It will be noted (Table 7) that seine captains require an annual depreciation allowance equal to between three and four times the average amount required by trollers and gillnetters. This difference would be greater if records from captains were limited to boat owners. In the sample of captains, 13 owned boats while 12 operated seiners owned by companies. In the gillnetter and troller samples, practically all of the fishing capital was owned by the fishermen.

A comparison of the relative percentage change in incomes from 1953 to 1954 for these four types of salmon fishermen is shown in Table 8. It will be noted that the percentage increase in net cash operating receipts in 1954 differs very little for gillnetters, captains and assistants. Trollers, however, reported a decline in net cash receipts of 4 per cent. In the comparison of total net incomes, after adding income from sources outside the fishing industry, gillnetters showed a 6 per cent increase over 1953 income, captains reported an increase of 13 per cent, and assistants reported an increase of 11 per cent.

Table 8

Percentage Change in Incomes of 172 Salmon Fishermen, Grouped by Type, 1954 relative to 1953

	Gillnetters	Trollers	Seine Assistants	Seine Captains
No. of fishermen	64	51	32	25
	per cent	per cent	per cent	per cent
Total cash operating receipts	+ 8	- 5	+ 15	+ 10
Total cash operating expenses	+ 2	- 7	+ 11	+ 1
Net cash operating receipts	+ 13	- 4	+ 16	+ 14
Non-fishery income	- 10	- 1	- 5	+ 1
Total net cash income	+ 6	- 4	+ 11	+ 13

3. Fishing Capital

In a preceding section, it has been stated that, in the primary fishing industry in British Columbia, the amount of capital employed in relation to labour is generally higher than the capital employed in sea fisheries elsewhere in Canada. With modern equipment such as radio telephones, automatic pilots, auxiliary steering controls, powered winches and gear hauling devices, many salmon fishing enterprises have been reducing the size of their crews. The largest proportion of gillnet and troll boats are now operated by a single fisherman. Drum seiners are operated by a crew of three to four men. The larger table-seiners still use six to eight men, but the introduction of the "Puretic" power block to the seine fleet in 1955 replaced the hand hauling of seine nets and enabled table-seiners to make a larger number of sets per day.

The survey records taken from salmon fishermen show, in general, a positive relationship between fishing capital and fishermen's incomes. The records indicate that the better boats and equipment yield higher incomes to both owners and assistants.

The 172 salmon fishermen interviewed in 1953 and 1954 estimated the current market value of their boats and fishing equipment and these were tabulated to show the average capital for different types of salmon fishermen (Table 9). Excluding the capital owned by seine assistants, the average value of fishing capital was lowest for gillnet fishermen and highest for seine captains. The proprietorship of capital in the seine fleet is considerably different, however, from that of the gillnet and troller fleets. The boats and equipment used in the latter two types of fishing are owned predominantly by fishermen who operate them, while seiners, which require a greater capital investment per operating unit, are owned both by individual fishermen and fish processing companies.

Of the 64 gillnet fishermen interviewed in 1954, all except five owned their boats. Of these five, four rented boats from companies and a fifth fished with his father, on the father's boat. The troller fishermen owned all of the boats they used but two were owned and operated on a two-man partnership basis. Among the 25 seine captains, however, only 13 were boat owners and three of these were part-owners of seiners operated on a partnership basis. Five of the 32 seine assistants owned some fishing capital but only three reported ownership of seine boats and nets and only one of these owned the boat on an individual basis. The ordinary assistant does not risk any capital investment but contributes only his labour to the fishing operation. The survey sample of assistants had the least investment in fishing capital of all types of salmon fishermen, averaging only $682 per man in 1954.

Table 9

Average Value of Fishing Capital Owned by Salmon Fishermen, British Columbia, 1953 and 1954

	Gillnetters		Trollers		Seine Assistants		Seine Captains	
No. of fishermen	64		51		32		25	
	1953 $	1954 $	1953 $	1954 $	1953 $	1954 $	1953 $	1954 $
Boats	2,907	2,893	4,907	4,785	574	611	13,465	15,101
Gear	703*	473	174	177	125	32	2,739	2,667
Shore equipment	215	242	71	53	39	39	79	72
Total	3,825	3,608	5,152	5,015	738	682	16,283	17,840

* The 1953 value for gillnet gear is considerably higher than the end of year value shown in 1954. This was due to a difference in methods of taking inventory and not because of a significant decline in the amount of gear used.

In many cases, a seine captain may operate more than one boat during a fishing year, particularly when he combines salmon operations with halibut and herring fishing. He may operate his own seiner during the salmon season but operates or works as assistant on a company-owned seiner during the herring season. In addition, he may operate a different boat during the halibut season. While no attempt has been made to show the capital equipment owned by captains compared with that of companies for all of these different fishing operations, a comparison is given for the amount of capital used in salmon operations alone (Table 10). This gives a clearer picture of the amount of capital required in salmon seine enterprises.

In salmon fishing alone, the 25 captains operated equipment valued at $833,200. Of this total they owned an amount of $380,492, or 46 per cent of the total. In addition to the capital used in direct salmon operations by themselves, these captains chartered or rented out fishing capital in boats and equipment valued

Table 10

Fishing Capital Used in Salmon Fishing by 25 Seine Captains, British Columbia, 1954

	Owned by Captains		Owned by Companies and Others		Total Operated	
	No.	$	No.	$	No.	$
Boats	13	325,042	12	408,958	25	734,000
Seine nets	16	55,450	9	43,750	25	99,200
Total	-	380,492	-	452,708	-	833,200

Note: Capital values represent estimated current market values at the end of 1954. Three of the seine boats were owned on a partnership basis and only the captains' share of these boats is included in the value owned by captains. In 1953, the total capital owned by these captains was $332,033, and capital owned by companies totalled $461,775. The captains therefore, owned about 42 per cent of the capital used in salmon operations.

at $65,517 in 1954. The total value of all capital owned by captains was $446,009 representing an average of $17,840 per fisherman. Among this sample of captains, however, there were five who showed no capital ownership whatsoever.

In general, historical information obtained during the survey indicates that it takes a long time to accumulate the large amount of capital required for seine boats and seine equipment. Some of the seine captains made their initial investment in salmon fishing by purchasing a gillnet boat. During the years required to accumulate savings to invest in a seine boat, these fishermen also gained the experience required to operate larger boats. Most of the seine captains were veteran fishermen with from 10 to over 30 years experience. As stated above, a number of seine captains operated different boats during the salmon, halibut and herring seasons. In the herring operation particularly, larger boats and more expensive seine nets are used and a higher proportion of the fishing capital is owned by fish processing companies. In this group of captains, 11 participated in herring fishing in 1954 but only four operated their own boats and none of them owned herring gear. New

herring purse-seine nets range from $15,000 to $25,000 in cost, which, in addition to the risk element in operating this type of gear, practically prohibits ownership by individual fishermen.

If the indebtedness of the different types of salmon fishermen is compared with the total value of capital owned by them, it provides the relation of debt to the amount of capital owned, or the approximate capital equity (Table 11). The troller fishermen showed the lowest debt in relation to the value of capital owned, while seine captains reported the highest. Approximately one-third of the trollers and gillnetters, and half of the seine captains reported debts.

Table 11

Capital Indebtedness of Salmon Fishermen,
British Columbia, 1953 and 1954

No. of Fishermen	Year	Total Value of Fishing Capital	Total Debt	Per Cent Debt of Total Capital	No. Reporting Debts
		$	$	%	No.
64 Gillnetters:					
	1953	244,788	56,578	23	27
	1954	230,901	50,018	22	24
51 Trollers:					
	1953	262,761	37,706	14	18
	1954	255,752	31,591	12	16
25 Seine Captains:					
	1953	407,077	134,559	33	11
	1954	446,009	159,184	36	13

Note: Since only a few of the seine assistants owned fishing capital, their indebtedness is not shown here.

The increase in the seine captains' fishing capital in 1954 was mainly due to additional capital acquired by three of the captains, as two exchanged the seiners used in 1953 for higher valued boats and one acquired part-ownership of a new seiner.

Gillnet and troll fishermen reported lower capital expenditures in these two years. Among the 64 gillnetters, two fishermen purchased second-hand boats in 1953 and one bought a second-hand boat in 1954. Among the 51 troll fishermen, one built a new boat in 1953 and another bought a second-hand boat in 1954. Among the most noticeable items of capital expenditures, for gillnet and troll fishermen, were radio telephones and depth recording equipment. In 1954, five of the gillnet fishermen bought new radio telephones and six purchased depth recorders, with expenditures ranging from $130 to $876 for this equipment. Considering the entire samples of gillnet and troll fishermen, however, capital expenditures on all items averaged only $132 to $166 per fisherman in each of the two years covered by the survey.

Fishing boats are the most costly items of capital owned by salmon fishermen, and their size and efficiency affects the extent of fishing operations and fishing incomes considerably. Although the average values and lengths of boats has already been shown, they give only an overall estimate of these factors. A more detailed examination reveals a considerable range in values and also in boat lengths (Table 12).

Table 12

Size, Value and Period of Ownership of Boats Owned by Salmon Fishermen, British Columbia, 1953

Number of Fishermen	Average Boat Length	Range in Length	Range in Value	Average Ownership Period
	(overall in feet)		$	years
59 Gillnetters	30	22 - 36	200 - 9,000	6
50 Trollers	34	25 - 44	1,000 - 14,000	9
12 Seine Captains	55	44 - 72	10,000 - 40,000	11

Note: One 12 foot canoe owned by a troller fisherman, and a 14 foot open boat owned by a gillnet fisherman were omitted in the above comparison.

The gillnet fishermen had owned their boats an average of 6 years, troller fishermen 9 years, and seine captains 11 years. The average number of years fishermen had owned these boats does not indicate their actual age since original

construction because some fishermen had bought second-hand boats. The boats owned by 12 of the seine captains, for example, were 19 years old on the average, while the remaining 13 company-owned seiners had an average age of 22 years.[1]

4. Number of Days Spent Fishing and Net Receipts Per Day

The salmon fishermen interviewed provided details on the number of days afloat during the fishing year and also the total number of days engaged in fishing operations, including the number of days afloat and days spent ashore repairing boats and fishing equipment.[2]

Although there was a considerable variation among fishermen in the number of days spent afloat, when they are grouped together the averages show that the length of fishing time is very similar for different types of salmon fishermen. This is no doubt due to the shortness of the salmon season, which is restricted further by fishing regulations enforcing week-end closures. All types of fishermen normally attempt to fish the entire length of the season and this results in the uniformity of fishing time that is revealed by group averages. An examination of the monthly landings of salmon in all British Columbia, illustrates the intensity of fishing in the summer and fall seasons. In both 1953 and 1954, over 90 per cent of the annual catch of salmon was taken in the four-month period of July to October.

In 1953 and 1954 the different types of salmon fishermen interviewed averaged from 71 to 98 days afloat (Table 14). Gillnetters, trollers and seine captains averaged 80 to 98 days afloat in these two years. Seine assistants spent less time fishing, averaging 74 days afloat in 1953 and 71 days in 1954.

The total number of days engaged in all fishing operations, including days afloat, days spent ashore repairing equipment, and week-end closures during the season, generally amounted to about twice the number of days spent afloat. The seine captains averaged the highest number of days in these two years, spending 175 days engaged in such operations in 1953 and 182 in 1954. Gillnetters and trollers put in nearly as much time, but seine assistants averaged nearly forty days less than other types of fishermen.

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1 These averages are probably representative of the average age of all seiners. In checking a Fisheries Department list of 350 seiners, of 10 tons or over, operating in British Columbia in 1954, it was found that the average age was slightly above 20 years.

2 Of the two measurements of time, the number of days afloat is the most accurate because fishermen's log books and dated fish sales slips provided a means of checking the actual days afloat.

A detailed distribution of salmon fishermen by the number of days afloat shows the variation in the amount of time spent fishing (Table 13). Of the 172 fishermen interviewed, 58, or one-third of the total, fished 100 days or more in 1953, but in 1954 only 42 fishermen were afloat 100 days or more. Of the total 172 fishermen, there were 125 who fished between 50 and 124 days in both years. This range, therefore, included over 70 per cent of the salmon fishermen interviewed. The importance of this wide variation in the number of days spent fishing arises from its close relationship with a corresponding variation in fishermen's incomes.

Table 13

Distribution of 172 Salmon Fishermen by the Number of Days Afloat, British Columbia, 1953 and 1954

	Gillnetters		Trollers		Seine Assistants		Seine Captains	
Days Afloat	1953	1954	1953	1954	1953	1954	1953	1954
	(Numbers of fishermen)							
Less than 25	2	4	-	2	-	1	-	-
25 - 49	10	11	6	5	6	5	-	2
50 - 74	19	13	6	11	10	15	4	10
75 - 99	17	18	14	19	11	8	9	6
100 - 124	10	10	14	9	4	1	7	5
125 and over	6	8	11	5	1	2	5	2
Total	64	64	51	51	32	32	25	25

If the number of days afloat is compared with the net fishing receipts of salmon fishermen, a measurement of the net receipts per day is obtained. For these different types of salmon fishermen, the average daily receipts were highest for seine captains and lowest for trollers (Table 14). These receipts comprise net fishing receipts after all cash operating expenses have been deducted, although no allowance has been made for depreciation. For seine captains, these daily receipts averaged

Table 14

Average Number of Days Afloat and Average Net Receipts per Day, 172 Salmon Fishermen, British Columbia, 1953 and 1954

Number of Fishermen	Year	Average No. of Days Afloat	Average Net Cash Operating Receipts	Average Net Receipts Per Day Afloat
		No.	$	$
64 Gillnetters:				
	1953	80	1,817	23
	1954	83	2,053	25
51 Trollers:				
	1953	98	1,935	20
	1954	87	1,847	21
32 Seine Assistants:				
	1953	74	2,318	31
	1954	71	2,684	38
25 Seine Captains:				
	1953	98	5,914	60
	1954	86	6,774	79

two to three times as high as those of the other three types of fishermen. Even with deductions for depreciation which, because of their greater investment, were higher for seine captains, their net receipts still averaged $51 per day in 1953 and $68 in 1954. Allowances for depreciation would also increase the relative difference in average receipts shown for gillnetters, trollers and seine assistants, since the assistants had very little capital to be depreciated. Net receipts of $31 to $38 per day for assistant fishermen are, therefore, very favourable when compared with those of gillnet and troll fishermen. In addition, when the fishing season is over the assistants' work is completed while other fishermen who own boats and fishing gear spend a considerable length of time repairing their equipment in preparation for the next fishing season.[1]

1 Seine assistants often help to repair boats and equipment on shore, but with the exception of loading and unloading fishing gear, they usually receive cash wages from boat owners for this work. These wages were included as "other fishery receipts" in assistants' records.

5. Incomes of 172 Salmon Fishermen

(a) Method of Determining Net Income

The incomes of fishermen are determined by the total value of fish caught, and by the operating expenses and capital costs involved in operating the boats and fishing equipment. To measure fishermen's net incomes it is necessary to determine their gross sales of fish and then deduct all fishing costs. The residual, or net income remaining to fishermen is the most important measure of fishermen's economic activities because this is the amount available for living expenditures. Measures of net income also permit comparison of incomes of Canadian fishermen with those of other occupational groups.[1]

In this survey, the net fishing incomes of salmon fishermen were calculated in three major steps: fishing receipts, operating expenses, and depreciation costs. The details of the various items of receipts and expenses are shown in separate tables (see Tables 15 and 16).

In the crew sharing arrangements or "lay" settlements the seine captain shares both receipts and expenses with his assistants and, in determining the captain's gross share (which would be equivalent to the gross receipts of a gillnet or troll fisherman operating alone) it is necessary to obtain the entire account of the crew settlement. In salmon seining, for example, the captain's share of the crew's expense for fuel and food must be added to his net share in order to arrive at his true gross receipts. Captains' bonuses are also included in these receipts. In some cases captains who own seine boats also receive a commission which is based on the quantity of fish delivered and actually represents an additional payment by the fish processing company.

The captains' or assistants' cash receipts from each species were assumed to be in proportion to the respective values of the different species in the total crew catch. For instance, if sockeye contributed forty per cent of the total catch, it was assumed to have comprised forty per cent of the individual fisherman's receipts.

The captains' and assistants' shares from herring or halibut fishing were determined in the same manner as salmon shares. Receipts from these or any type of fishing

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1 Other information on Canadian fishermen's incomes is available from Department of Fisheries' economic surveys and studies in Newfoundland, the Maritime provinces and Quebec. Information is also available from the first census of the primary fisheries in Canada, taken in 1951-52. Estimates of average net incomes for fishing enterprises, derived from the census data, reveal considerably higher incomes in British Columbia than in the Maritime Provinces and Newfoundland.

other than salmon are included as "other fish receipts". Herring and halibut share arrangements differ from salmon settlements, however, and these differences must be considered in determining the fishermen's shares.

(b) Fishing Receipts

The records of fishing receipts revealed wide differences between different types of salmon fishermen. The group averages of total cash operating receipts, or gross receipts, ranged from $2,618 to $3,499 for gillnetters, trollers and seine assistants, while receipts of seine captains were considerably higher, averaging $8,941 in 1953 and $9,832 in 1954 (Table 15).

The fishing receipts of all four groups of salmon fishermen, except trollers, increased substantially from 1953 to 1954. Gillnetters showed an average increase in total cash operating receipts of $260 per fishermen. Seine captains increased their receipts by an average of $891 and assistants on seiners showed an increase of $400. Troller fishermen, on the other hand, showed an average decline of $155.

In making these comparisons it should be repeated that certain types of fishermen are largely dependent for their income on particular species of salmon. As a result, changes in the abundance of a particular species may have a substantial influence on the incomes received from fishing from year to year. In the case of troller fishermen, the catches of spring and coho salmon, both of which decreased in 1954, constituted from 90 to 95 per cent of the total value of the troller catch in both of the years in which the survey was conducted. As a result, neither the fall in the catch of spring, which averaged $288, nor the fall in coho, which averaged $53, was offset by increases in the catch of other species. Therefore, the relative scarcity of spring and coho resulted in reduced trolling catches and an accompanying reduction in receipts.

Gillnet and seine fishermen made their major gains in fishing receipts in 1954 by increased landings of sockeye and chum salmon. The sample of 64 gillnetters reported an average increase in sockeye receipts of $136. Their chum receipts averaged $195 higher, while receipts from pink dropped by $146. The 25 seine captains reported an average increase in sockeye receipts of $1,121. Their chum receipts increased by $687, but receipts from pink salmon declined by $1,245. Assistants showed an average increase in sockeye of $394. Chum receipts were up $255 but pink receipts were down $437 per fisherman.

Other fish receipts, which were from halibut and herring fishing mainly, added significant values to the seine assistants' and captains' receipts. The captains' other fish receipts increased in 1954 by an average of $231 per fisherman. This was due to higher herring receipts, as 11 captains fished herring compared with six in 1953. Eight of the captains fished halibut during both years. Of the 32 assistants, four fished herring both in 1953 and 1954 while 10 fished halibut in 1953, compared with nine in 1954.

Table 15

Cash Operating Receipts of 172 Salmon Fishermen, Averages by Type, British Columbia, 1953 and 1954

	Gillnetters		Trollers		Seine Assistants		Seine Captains	
No. of fishermen	64		51		32		25	
Receipts from	1953	1954	1953	1954	1953	1954	1953	1954
	$	$	$	$	$	$	$	$
Sockeye	1,828	1,964	6	35	345	739	972	2,093
Spring	202	230	1,296	1,008	16	8	112	28
Coho	148	182	1,326	1,273	114	109	301	270
Pink	316	170	52	22	763	326	2,517	1,272
Chum	457	652	93	131	527	782	1,947	2,634
Other	11	20	1	1	6	2	8	9
Total salmon	2,962	3,218	2,774	2,470	1,771	1,966	5,857	6,306
Other fish	189	155	113	206	570	740	1,309	1,540
Collecting	51	61	-	-	41	65	276	114
Other fishery receipts	36	63	10	49	43	104	156	170
Chartering vessels	1	2	13	30	193	143	1,343	1,702
Total cash operating receipts	3,239	3,499	2,910	2,755	2,618	3,018	8,941	9,832

Some of the gillnetter and troller fishermen also fished halibut in the "mosquito" or small boat fleet but only the seiners engaged in herring fishing in British Columbia[1] with the result that the receipts from other fish were much smaller for the gillnet and troll fishermen interviewed. Of the 64 gillnetters, only 28 reported receipts from other fish in both 1953 and 1954, while 25 of the 51 troller fishermen reported receipts from other fish in 1953 compared with 35 in 1954. For most of the gillnet and troll fishermen, other fish receipts, with the exception of those from halibut, were of a minor nature. However, a few gillnet fishermen reported receipts ranging as high as $760 from shrimp trawling and a number of troll fishermen reported receipts of several hundred dollars from ling cod.

Considering these 172 salmon fishermen as a single group, 80 showed receipts from fishing other than salmon in 1953 and 89 reported such receipts in 1954. This provides some conception of the limited diversity of fishermen's operations as it may be seen that slightly less than half of these fishermen caught other fish as well as salmon in the two years in which the survey was conducted. The remaining fishermen were dependent on salmon alone as a source of income from fishing. Under existing conditions in the British Columbia primary fishing industry, the chief advantage of a diversified operation is that it enables a fisherman to lengthen his fishing time and thereby increase his productive capacity. A few of the seine captains and assistants interviewed who fished herring and halibut as well as salmon were on crews which landed several million pounds of fish. In 1954, for example, one crew of eight fishermen landed salmon, herring and halibut valued at a total of $137,696. This consisted of 177,961 pounds of salmon,[2] 215,000 pounds of halibut and 2,600 tons of herring, or a total of over 5.5 million pounds of fish. This crew put in 21 days afloat fishing salmon, 71 days fishing halibut and 80 fishing herring, a total of 172 fishing days for the year.

As to the remaining receipt items, including cash receipts from collecting fish, other fishery receipts,[3] and receipts from chartering vessels, the latter of these was the most important but receipts from chartering vessels were limited to seine boat owners. Seven of the captains interviewed in 1953 had chartered their boats to the processing companies and received a per diem payment instead of the usual boat share of the fish. In 1954, nine captains chartered their boats. A comparison of the totals of these captains' charter receipts with the salmon boat shares which were retained by

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1 Some herring is caught with other fishing gear but the amounts are insignificant.
2 Some of the seine crews landed up to 400,000 pounds of salmon during the season.
3 Other fishery receipts include any cash wages received while repairing fishing boats or working in fish processing plants.

the fish processing companies showed little difference, although among individual vessel owners the charter payments in some cases exceeded the boat shares, while in other cases they were less than the boat shares.[1] If a vessel owner charters his boat, however, he is still responsible for its maintenance and in all cases those fishermen who owned seiners reported their expenses for repairs and maintenance.

It has been mentioned above that some of the seine captains received a fish commission from the companies. In some cases these captains also received additional bonuses above the normal one-eighth share of the boat and gear earnings. The additional payments received from commissions and extra bonuses increased the 25 captains' receipts by an average of $881 in 1953 and $979 in 1954. These additional receipts amounted to nearly 10 per cent of their total gross receipts.

(c) Fishing Expenses

The operating expenses of these 172 salmon fishermen changed very little in the two survey years. The aggregate cost of all items such as fuel, fishing gear, and hull and engine repairs, totalled $226,010 in 1953 compared with $226,036 in 1954. Considering the different types of salmon fishermen separately, however, the troller fishermen reported the greatest change in expenses, with a decline in 1954 of nearly 11 per cent compared with expenses in the previous year. On the other hand, expenses for the other types of salmon fishermen increased slightly in 1954 (Table 16).

While trollers showed a decline in total expenses of $67 per fisherman in 1954, gillnet fishermen had an average increase of $24, seine assistants an increase of $34, and seine captains an increase of $31. Fishing gear, fuel, hull and engine repairs, and insurance, accounted for 87 per cent of the gillnetters', trollers' and seine captains' operating expenses in the two survey years.

For gillnetters, fishing gear is the greatest item of expense. Their records show that gear expenses accounted for 55 per cent of all operating expenses. Comparing all items of gillnetters' expenses in both years, the greatest change was in the expense for gillnets and gear repairs, which declined by an average of $77 per

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1 Vessel owners generally prefer to charter their boats because the per diem rate (which is usually not less than $30 during the salmon season) offers more certainty than the boat share, which is dependent on the value of fish caught. When the captain charters his boat he also receives a bonus of one-eighth of the boat share. The charter payment is made for the entire fishing season and the owner receives payment for time which includes normal week-end closures when the boat is not fishing. Among seine captains interviewed, the usual length of salmon season charters were 130 to 140 days.

Table 16

Cash Operating Expenses of 172 Salmon Fishermen, Averages by Type, British Columbia, 1953 and 1954

	Gillnetters		Trollers		Seine Assistants		Seine Captains	
No. of fishermen	64		51		32		25	
Operating expenses	1953	1954	1953	1954	1953	1954	1953	1954
	$	$	$	$	$	$	$	$
Fuel & oil	284	295	336	296	111	87	378	260
Bait & ice	10	8	21	27	32	31	49	38
Gear material & repairs	161	136	242	214	23	33	1,041	1,095
Gillnet purchases	666	614	-	-	-	-	-	-
Hull painting & repairs	55	78	100	93	14	12	451	404
Engine & equipt. repairs	80	113	79	101	5	13	250	258
Fish clothes	24	22	33	23	44	52	73	58
Wages paid	13	6	33	18	-	-	34	5
Taxes, license fees, etc.	24	25	24	27	33	52	118	132
Insurance	42	39	74	75	27	30	441	554
Interest	4	37	12	24	9	23	181	209
Rentals	46	61	3	5	1	-	-	1
Other	13	12	18	5	1	1	11	44
Total cash operating expenses	1,422	1,446	975	908	300	334	3,027	3,058

fishermen in 1954. The higher expense in 1953 was due to a considerable number of fishermen changing from linen to the more expensive nylon nets. By 1954, the change to nylon gear was more complete and some fishermen who had purchased nylon nets for the first time in 1953, were able to use these nets a second year, resulting in a decline in operating costs.[1]

For the sample of trollers, fuel was the highest expense, accounting for 34 per cent of all expenses in the two survey years. In 1954 however, troller fuel costs declined by an average of $40 per fisherman, reflecting the reduced number of days afloat (from an average of 98 days in 1953 to 87 in 1954). Fuel expenses also showed the greatest change of all expenses paid by seine captains, declining by an average of $118 in 1954. This decrease was again primarily due to a decline in the number of days afloat (from an average of 98 days in 1953 to 86 in 1954). However, part of the decline was due to captains' restricting the use of their boats to seine operations in 1954, while in the previous year a few of them used their boats for salmon trolling for short periods and this involved more travelling and incurred higher fuel expenses. The decline in seine captains' fuel expense was offset by an increase in insurance costs averaging $113. This increased expense was primarily due to the insuring of additional fishing capital by the three captains who increased their capital investment in 1954.[2]

Among smaller items of expense, it will be noted that average interest costs increased for all types of salmon fishermen in 1954. This increase was not due to an increase in debts because all of these fishermen except the seine captains reported less indebtedness in 1954 than in the previous year (see Table 11). Prior to 1954,

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1 Nylon gillnets are generally more efficient than linen. Their greater catching power is attributable to the greater elasticity and transparency of nylon. The records from gillnet fishermen also showed a much faster rate of depreciation on linen nets, averaging 85 per cent on first year nets while the depreciation on nylon nets averaged 55 per cent. According to these rates of depreciation, therefore, linen gillnets only withstood a little over one year's fishing but nylon nets could usually be fished two years.

Expenditures for new nylon nets probably raised gillnet fishermen's total operating costs above longer-run averages during the two survey years. Exclusive of cork and lead lines (which generally last longer than either nylon or linen net web), gillnet fishermen interviewed in 1954, spent an average of $515 per net for new nylon web, compared with $348 per net for new linen web. These nets were 200 fathoms in length but varied in mesh size and depth.

2 One captain who had operated a company boat in 1953 acquired part ownership of a boat in 1954, a second sold his boat and built a new one, and the third captain exchanged his boat for a larger vessel.

however, interest was charged only on exceptional outstanding debts while, in 1954, fish processing companies which had extended credit found it necessary to widen the interest charges.

Insurance costs remained relatively the same for all types of fishermen except seine captains, who incurred higher costs in 1954. All except one of the seine boat owners carried insurance. Among the gillnet and troll fishermen, however, nearly half of the boats were not insured. In 1954, only 37 of the 59 gillnet boat owners carried insurance, and in the same year, 25 of the 51 troll fishermen carried insurance. Trollers and gillnetters with the higher fishing receipts carried more insurance. Of 16 trollers who had net cash operating receipts below $1,000 in 1954, only one carried insurance.

(d) Capital Depreciation

To allow for depreciation on capital equipment owned by salmon fishermen, a schedule of fixed annual percentage rates was used. These rates varied with the age of the boat or equipment in use. Depreciation was allowed on hulls, engines and all boat equipment, as well as shore installations.[1] New capital expenditures were also included in the value of boats and equipment for depreciation purposes. No depreciation was allowed on fishing gear, however, as all new purchases and gear repairs were included in cash operating expenses.

The total capital equipment (excluding fishing gear) owned by the 172 salmon fishermen was valued at $811,904 in 1953 and at $847,498 in 1954. On this capital, depreciation of $54,431 and $55,202 was allowed in 1953 and 1954, respectively. The rate of depreciation, therefore, averaged nearly 7 per cent of the value of capital in both years.

The depreciation allowance for fishing capital remains relatively fixed from one year to the next, and therefore it is not a significant factor in the income changes which occurred in this two-year period. Nevertheless, it is a fixed cost, and when gross receipts rise or fall, a fixed allowance for depreciation will cause a greater percentage change in net incomes than is shown by the change in gross receipts.

(e) Incomes of Seine Boat Owners Compared with Those of Non-owners

As stated above, the amount of capital equipment used in fishing has an important influence on fishermen's incomes. The records from these salmon fishermen reveal that those with more capital (as shown by the value of their equipment)

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[1] The schedule of rates used in calculating capital depreciation is included in Appendix B, Table A-9.

generally received higher net incomes from fishing. It may be expected, therefore, that there would be significant differences in individual seine captains' incomes because about half of the seine captains operated company boats and had very little capital invested in the fishing enterprise. The records from seine captains show that those who owned their boats had net incomes from fishing which averaged over $2,000 above the incomes of those who operated company boats (Table 17).

The group of captains who owned their boats reported fishing capital valued at an average of $29,821 in 1953 and $30,439 in 1954. Some of the captains who did not own boats, owned seine nets which were operated on company boats, and a few owned gillnet and troll boats which they rented or chartered to other fishermen. The latter group of captains valued their fishing capital at an average of $3,787 in 1953 and $4,192 in 1954, or about one-eighth of the capital values reported by boat owners.

Total receipts for boat owners averaged more than double those of non-owners, but higher operating expenses reduced this advantage in receipts; in 1953, net cash operating receipts averaged $7,829 for boat owners and $4,147 for non-owners. In 1954, although net cash receipts were higher for both groups of captains, the relative difference was about the same as in 1953. After allowing much higher depreciation charges for boat owners, this group had net fishing incomes of $6,165 per fisherman in 1953 and $7,150 in 1954. This was $2,149 above the average for non-owners in 1953 and $2,708 higher in 1954.

Fishermen who have capital invested in their fishing enterprises should compare the possible yield of their investment in alternative uses, to ascertain whether this capital is yielding a satisfactory return. It will be recalled from the foregoing discussion on indebtedness however, that captains owed debts amounting to over 30 per cent of the value of their capital (See Table 11). After deducting their debts, the captains who owned their boats showed an average capital value of $19,530 in 1953, and $18,963 in 1954. The non-owners showed an average of $2,935 in 1953 and $3,358 in 1954. Therefore, the difference in owned capital between these two groups was about $16,000 per fisherman in both years. At an interest rate of 5 per cent, this would represent additional investment costs averaging $800 for those captains who owned their boats. As the boat owners received net incomes of over $2,000 above those received by non-owners, it is evident that the returns to capital were more than sufficient to cover the higher depreciation and assumed interest cost at the above rate.

The difference in income between these two groups of captains was related, primarily, to the considerable difference in their capital. There was little difference in the size of boats, as the average length was 55 feet for those used by both groups

Table 17

Receipts and Expenses of 25 Seine Captains, Averages for Owners and Non-owners, British Columbia, 1953 and 1954

	Boat Owners		Non-owners	
	1953	1954	1953	1954
Number of fishermen	12	13	13	12
Fishing capital (dollars)	29,821	30,439	3,787	4,192
Receipts	$	$	$	$
Salmon	8,243	7,765	3,655	4,725
Other fish	1,568	2,418	1,069	588
Collecting	272	185	280	37
Other fishery receipts	45	103	259	243
Chartering vessels	2,683	3,048	106	245
Total	12,811	13,519	5,369	5,838
Expenses				
Fuel & oil	531	324	237	191
Gear material and repairs	1,365	1,414	741	749
Hull painting and repairs	938	754	2	24
Engine and equipt. repairs	497	454	23	46
Taxes, licence fees, etc.	197	209	45	49
Insurance	856	1,001	58	69
Interest	378	373	-	33
Other	220	201	116	87
Total	4,982	4,730	1,222	1,248
Net cash operating receipts	7,829	8,789	4,147	4,590
Depreciation on capital	1,664	1,639	131	148
Net after depreciation	6,165	7,150	4,016	4,442

of captains in 1953, while in 1954 the boat owners operated vessels averaging 57 feet, compared with a 53 foot average for the company boats. The captains who operated their own boats, did put in more fishing time than those on company boats, as in 1953 the boat owners spent an average of 104 days afloat compared with an average of 93 days for the other captains. In 1954, these averages were 93 and 78 for owners and non-owners, respectively. In allocated net crew shares (exclusive of commissions and boat and gear shares) the captains who owned boats received an average of $2,973 in 1953 and $3,679 in 1954. The other captains received an average of $2,260 in 1953 and $2,580 in 1954. Thus for each year, about $900 of the difference in income between these two groups can be attributed to the higher crew shares or labour earnings of the boat owners. The remaining difference of over $3,000 each year (see Table 17, net cash operating receipts) was mainly due to the difference in receipts from capital, such as boat and gear shares and charter receipts.

(f) Non-fishery Income

Income from occupations outside the fishing industry, receipts from social security and any other income, were added to the salmon fishermen's incomes from fishing to obtain their total annual incomes from all sources. Cash income from sources outside the fishing industry was recorded in net amounts to eliminate the necessity of deducting any expense involved in earning this income.

For the gillnetter, troller, and assistant seine fishermen, non-fishery income provided a significant part of the total income available from all sources. For the sample of seine captains however, although non-fishery income averaged over $500 per fisherman each year (Table 18), it amounted to only eight per cent of their net cash income from all sources. For all of the 172 fishermen considered as one group, non-fishery income accounted for slightly over 20 per cent of the total net cash income from all sources. Gillnet fishermen reported the highest receipts from non-fishery income, averaging nearly $800 per man in the two survey years. Seine assistants also reported significant earnings from non-fishery sources.

For all types of salmon fishermen except seine captains, the income shown as earnings in other occupations represented the highest proportion of non-fishery income. These earnings were derived through seasonal employment in woods work, construction work, or wages received from various firms in Vancouver or other centers. Some of these fishermen earned between $4,000 and $5,000 through their work outside the fishing industry. Very few of them, however, received cash income from agricultural work. The highest earnings reported were those from logging.

A comparison of these fishermen's non-fishery incomes, ranked in accordance with the distribution of their net cash receipts from fishing, indicates that

Table 18

Non-fishery Income of 172 Salmon Fishermen, Averages by Type, British Columbia, 1953 and 1954

	Gillnetters		Trollers		Seine Assistants		Seine Captains	
No. of fishermen	64		51		32		25	
Income Source	1953	1954	1953	1954	1953	1954	1953	1954
	$	$	$	$	$	$	$	$
Other occupations	571	460	356	233	551	407	175	125
Social security	106	129	142	116	118	108	162	167
Other income	162	166	100	241	89	203	186	237
Total	839	755	598	590	758	718	523	529

those groups of fishermen with lower receipts from fishing did not earn more from non-fishery sources than those with higher fishing receipts (Table 19). Although the two groups of gillnet fishermen with lowest receipts from fishing showed relatively high average incomes from non-fishery sources, the tendency was not entirely consistent, as the gillnetters with the highest fishing receipts also had high incomes from non-fishery sources. For trollers and seine captains, there was no definite relation between incomes from fishing and incomes from other sources, but the records of seine assistants showed an opposite tendency to those of gillnetters as the two groups of assistants with the highest fishing receipts also had the highest non-fishery incomes.

Table 19

Frequency Distribution of Net Cash Fishing Receipts of 172 Salmon Fishermen, with Non-fishery Income of Each Class, Two-year Averages by Type of Fishermen, British Columbia, 1953 and 1954

Distribution of Net Cash Receipts	Number of Fishermen	Net Cash Receipts	Non-fishery Income	Total Net Cash Income
		(Two year averages)		
	No.	$	$	$
64 Gillnetters				
Less than $1,000	20	634	996	1,630
$1,000 - 1,999	20	1,531	878	2,409
2,000 - 2,999	9	2,372	601	2,973
3,000 - 3,999	9	3,392	290	3,682
4,000 & Over	6	4,775	912	5,687
51 Trollers				
Less than $1,000	17	679	484	1,163
$1,000 - 1,999	15	1,525	596	2,121
2,000 - 2,999	9	2,502	587	3,089
3,000 - 3,999	6	3,541	993	4,534
4,000 & Over	4	4,562	471	5,033
32 Seine Assistants				
Less than $1,000	3	745	10	755
$1,000 - 1,999	14	1,500	637	2,137
2,000 - 2,999	9	2,352	758	3,110
3,000 - 3,999	1	3,395	1,452	4,847
4,000 & Over	5	6,447	1,279	7,726
25 Seine Captains				
Less than $2,000	1	342	579	921
$2,000 - 3,999	6	3,127	703	3,830
4,000 - 5,999	6	4,707	851	5,558
6,000 - 7,999	4	6,935	196	7,131
8,000 - 9,999	4	8,963	220	9,183
10,000 & Over	4	11,917	394	12,311

Note: Total net cash income (as in other tables given in this report) is the income from all sources before allowances for capital depreciation.

As non-fishery income was such an important part of the total incomes of these salmon fishermen, a further classification was made showing the distribution of non-fishery income by fishermen's place of residence (Table 20).

Table 20

Distribution of Non-fishery Income by Districts for 172 Salmon Fishermen, British Columbia, 1953 and 1954

	Fishermen living in		
	District 1	District 2	District 3
Number of fishermen	71	31	70
Non-fishery income (Average for 1953 and 1954)	$ 676	438	807

Fishermen living in District 3 reported the highest income from non-fishery sources, averaging $807 per year in 1953 and 1954. Those living in District 2 reported considerably lower incomes, averaging only $438 per year during this same period. It is apparent, therefore, that there is a relationship between fishermen's place of residence and the level of income received from alternative sources. Those fishermen living on Vancouver Island and in areas close to the city of Vancouver appear to have more opportunity for earning alternative income than other fishermen living in more isolated areas in the northern part of the Province, e.g., in District 2.

6. Variation in Salmon Fishermen's Incomes

An analysis of individual incomes, considered together with the historical statistics of salmon landings in British Columbia, reveals that the incomes of salmon fishermen are subject to sharp fluctuations. In the two years in which the survey was conducted, although the aggregate values of all salmon landings in British Columbia were closer to the average of the seven-year period between 1949 and 1955 than any of the remaining five years, the net incomes of the 172 salmon fishermen changed significantly (Table 21).

There is more than one aspect to this variation in salmon fishermen's incomes. The first and most important, is the fluctuation just referred to, that is, the change

in aggregate income of all fishermen due to the change in the quantity of salmon caught, changes in price, and changes in the composition of the catch, particularly in its content of high-valued sockeye, from one year to the next. The second aspect of income variation is that among individual salmon fishermen. In any given year, the incomes of fishermen differ widely. In the first place there are significant differences in the incomes of the four types of salmon fishermen. The two-year records showed that net incomes received by gillnet and troll fishermen were considerably below those of seine captains and seine assistants even though their fishing time, as measured by the number of days afloat, was much the same. Secondly, there is a wide difference in fishermen's incomes within each type of salmon fishing. These variations reveal the heterogeneous nature of the primary salmon fishing industry. They are generally related to a complex set of factors such as the individual fishermen's skill, the size and efficiency of boats and fishing gear, and the areas in which fishing is carried on.

The factors that cause fluctuations in all salmon fishermen's income from one year to the next can be more easily defined. But these factors, such as changes in the aggregate quantity of fish available or changes in price due to market conditions, are those over which fishermen have relatively little control. The factors which cause differences in income among fishermen in a given year should receive attention, however, as these are factors which individual fishermen can control more easily. By operating with more efficient equipment and by careful consideration of other factors such as the best fishing areas, fishermen who have lower incomes may be able to improve their relative position in the industry.

(a) Income Fluctuations from One Year to the Next

In examining the changes in incomes among all salmon fishermen from one year to the next, it is important to bear in mind that any given change in fishermen's gross income will cause a more than proportional change in net incomes. Fishermen maintain nearly the same quantity of gear and equipment and a large amount of all costs are fixed from year to year regardless of changes in the quantity of fish caught. It is the relative rigidity of these fixed costs which results in any change in gross receipts being reflected in a relatively accentuated change in net income.[1]

In 1953, the aggregate total of operating expenses for the 172 fishermen interviewed, amounted to 34 per cent of their gross receipts. In 1954 these costs were 32 per cent of gross receipts. Allowances for capital depreciation required an additional 8 per cent of gross receipts in both years (Table 21). Therefore, operating and

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1 There is an element of rigidity even in variable costs such as fuel. In poor salmon years fishermen will often travel more extensively and incur higher fuel expenses than they would have in abundant salmon years.

Table 21

Fluctuation of 172 Salmon Fishermen's Income, British Columbia, 1953 to 1954

	Totals All Fishermen		Relative Change	Per Cent of Total Receipts	
	1953	1954		1953	1954
	$	$	%	%	%
Total cash operating receipts	662,966	706,837	/ 7		
Total cash operating expenses	226,010	226,036	-	34	32
Net cash operating receipts	436,956	480,801	/ 10	66	68
Depreciation on capital	54,431	55,202	/ 1	8	8
Net income	382,525	425,599	/ 11	58	60

depreciation costs together, claimed about 40 per cent of these fishermen's gross receipts. If, in addition, interest costs were allowed for the capital investment in fishing boats and equipment, the net income figures would be further reduced.

Although the 172 fishermen's gross receipts in 1954 increased by only 7 per cent over those for 1953, net income increased by 11 per cent. In making this comparison for 1953 and 1954, it should be observed that, in these two years, the aggregate values of salmon landings in British Columbia were fairly normal. From 1951 to 1952, however, the value of all salmon landings showed a relative decline of 31 per cent, i.e., from $28.4 million to $19.6 million, respectively. If the survey had been conducted in this period, it would probably have shown that the decline of about 30 per cent in gross returns had resulted in a decline of around 45 per cent in net incomes. This estimation is made on the assumption that operating expenses and capital depreciation remain at about 40 per cent of gross receipts in a normal year. This estimate of the change in fishermen's incomes in 1951 and 1952, while based on 1953-54 operating expenses, indicates the extent of the fluctuations which may occur. As these two years immediately preceded the survey period, it is reasonable to assume that little change would have taken place in operating expenses.

(b) Income Differences Among Fishermen

As stated above, salmon fishermen's incomes vary within any given year not only between types of fishermen, who use different fishing equipment and rely on different species of salmon, but also within each type of salmon fishing. These wide differences are shown by a summary of ranges in receipts, expenses, and net cash receipts (Table 22).[1]

Table 22

Range of Receipts, Expenses and Net Cash Receipts of 172 Salmon Fishermen, British Columbia, 1953 and 1954

Number of Fishermen	Year	Total Receipts (Range in)	Total Expenses (Range in)	Net Cash Receipts (Range in)
		$	$	$
64 Gillnetters:				
	1953	744 - 8,246	218 - 3,825	- 580 - 5,941
	1954	668 - 10,220	213 - 4,029	208 - 6,722
51 Trollers:				
	1953	301 - 7,785	53 - 3,067	119 - 5,778
	1954	351 - 6,646	73 - 3,197	51 - 5,411
32 Seine Assistants:				
	1953	473 - 9,001	31 - 1,787	433 - 8,121
	1954	538 - 9,430	82 - 2,650	443 - 8,563
25 Seine Captains:				
	1953	1,881 - 20,679	268 - 6,534	1,125 - 14,455
	1954	2,552 - 21,208	181 - 7,024	1,809 - 15,746

Note: Table headings are abbreviated. Total receipts refer to total cash operating receipts, total expenses to total cash operating expenses, and net cash receipts to net cash operating receipts.

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1 The ranges in all items of receipts, expenses, etc., are provided in Appendix B, Tables A-1 to A-4.

In these two years, gillnet and troll fishermen reported net cash receipts ranging from a loss of $580 to a gain of $6,722. Seine assistants' net receipts ranged from $433 to over $8,500. Seine captains, however, showed the largest variation, with net receipts ranging from a loss of $1,125 to a gain of $15,746.

The figures given in Table 22 do not include income received from sources outside the fishing industry, since a major objective of this study was to assess the variation attributable to the incomes from the fishing enterprise. If capital depreciation was deducted from net cash receipts, the ranges in net incomes from fishing would be slightly lower in value than those shown.

(c) Distribution of Incomes from Fishing

The ranges shown for receipts, expenses and net receipts from fishing (Table 22), reveal that a number of the fishermen interviewed had incomes well below or above the group averages calculated for the four types of salmon fishermen (Table 7). When these fishermen's incomes were arrayed in ascending order of net cash receipts it was found that 106 of the 172 fishermen had net receipts below the group averages, in both 1953 and 1954. Thus over 61 per cent of them had net receipts below the sample averages, while 38 per cent had net receipts at or above these averages.[1]

Because of the variation in gross fishing receipts among salmon fishermen many of them have very small net incomes remaining after operating costs and depreciation charges are deducted, while some have substantial net incomes. This is evident when the 172 salmon fishermen are grouped in accordance with their net cash receipts from fishing (see relation of net income to gross receipts, Charts 1, 2 and 3).

From these charts[2] it is clear that, as gross fishing receipts increase, the proportion of these receipts required to meet operating and depreciation costs declines and the amount of net income remaining from each dollar of gross receipts increases.

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1 See Appendix B, Table A-5, and Charts A-1 and A-2, which show income distributions of the total net income from fishing and all other sources for all salmon fishermen interviewed in 1953 and 1954. Although incomes ranged to over $11,000 in both years, in 1953 over 76 per cent of the fishermen were grouped in the lower classes with incomes not greater than $3,999. In 1954 nearly 70 per cent of the fishermen were in these same lower classes.

2 It should be noted that the income classes shown in these three charts are the same as those given in Table 19. The number of fishermen in each income class can be found in this table. These same income classes are examined later under "Factors Related to Income Variations"

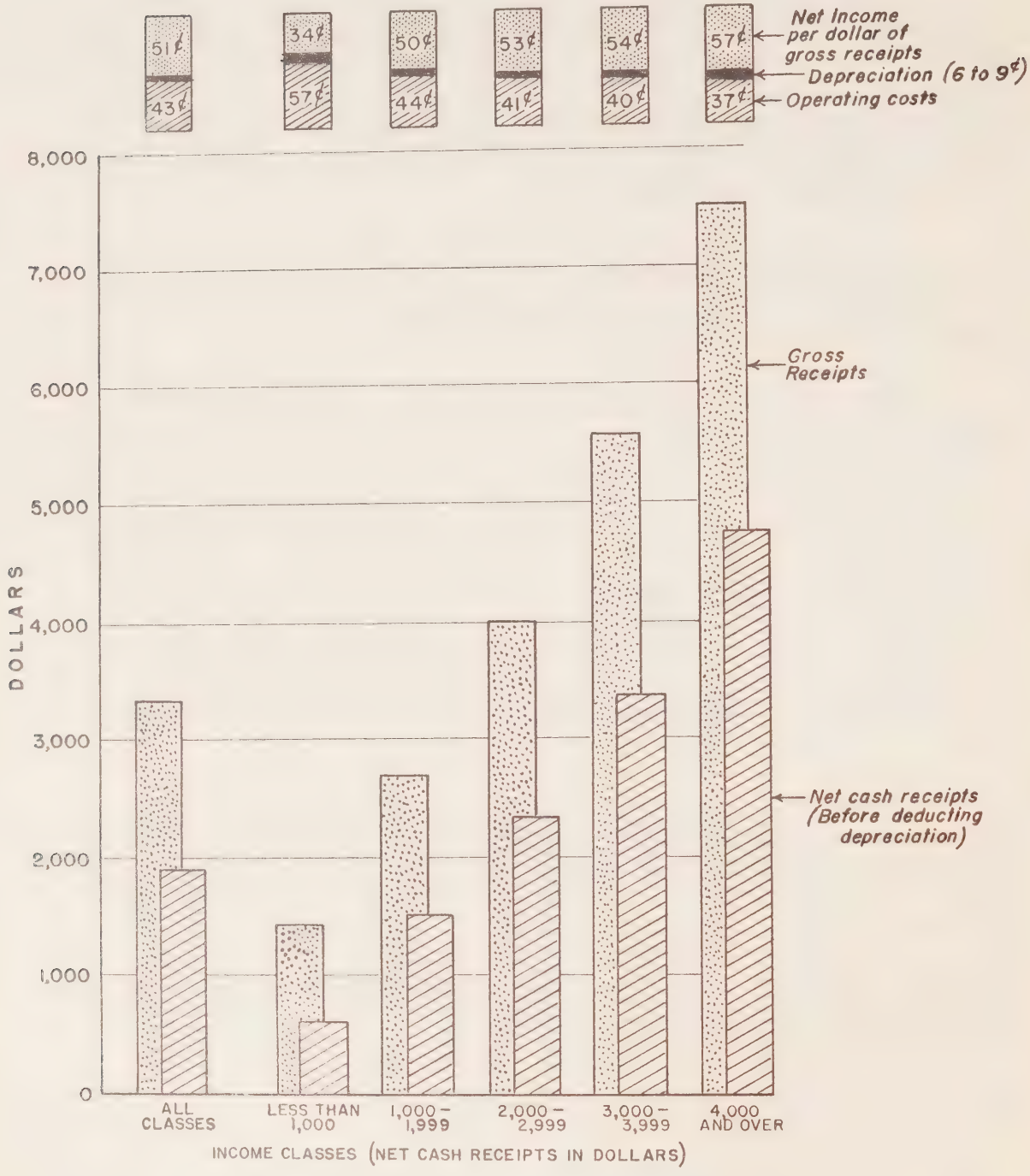
Among gillnet fishermen, for example, those (twenty) in the lowest income class averaged $1,461 in gross fishing receipts in 1953 and 1954 (Chart 1). Their net cash receipts however, averaged only $634, as 57 per cent of their gross income was required to pay operating costs. Meanwhile, the six gillnet fishermen in the highest income class averaged $7,554 in gross receipts during 1953 and 1954, and, as operating costs took only 37 per cent of their gross receipts they received an average of $4,775 in net cash receipts.

Troll fishermen's incomes showed a similar wide variation, with net cash receipts averaging $679 to $4,562 for the low and high income classes, respectively. Their net income per dollar of gross receipts averaged 48 to 67 cents from the lowest to the highest income class (Chart 2).

Among seine captains, much wider differences were found (Chart 3), but nearly half of the 25 captains did not own boats and consequently had no boat operating costs. Although gross receipts were low, net income per dollar of gross receipts was high for the two groups of captains in the $2,000 to $5,999 income classes as all except one of the 12 captains in these groups operated company boats and consequently had low operating costs. Captains in the other classes shown owned all except one of the boats operated. Thus the comparison for different income classes of captains did not clearly show the tendency towards a higher proportion of net income as gross receipts increased. The four captains in the highest income class, however, retained as net income 61 cents out of each dollar of gross receipts. The net cash receipts from fishing, after deducting operating costs, averaged $11,917 for this highest income class.

The group averages (see averages for All Classes, Charts 1, 2 and 3), show that operating costs were significantly higher for gillnet fishermen. They amounted to 43 cents out of each dollar of the gillnetters' gross receipts, compared with 33 cents for troll fishermen and 32 cents for seine captains. After deducting capital depreciation costs, gillnet fishermen retained 51 cents, or 51 per cent of their gross earnings, compared with 55 and 58 per cent for trollers and seine captains. From these examples it is clear that there are wide differences in the amount of net income earned by different salmon fishermen.

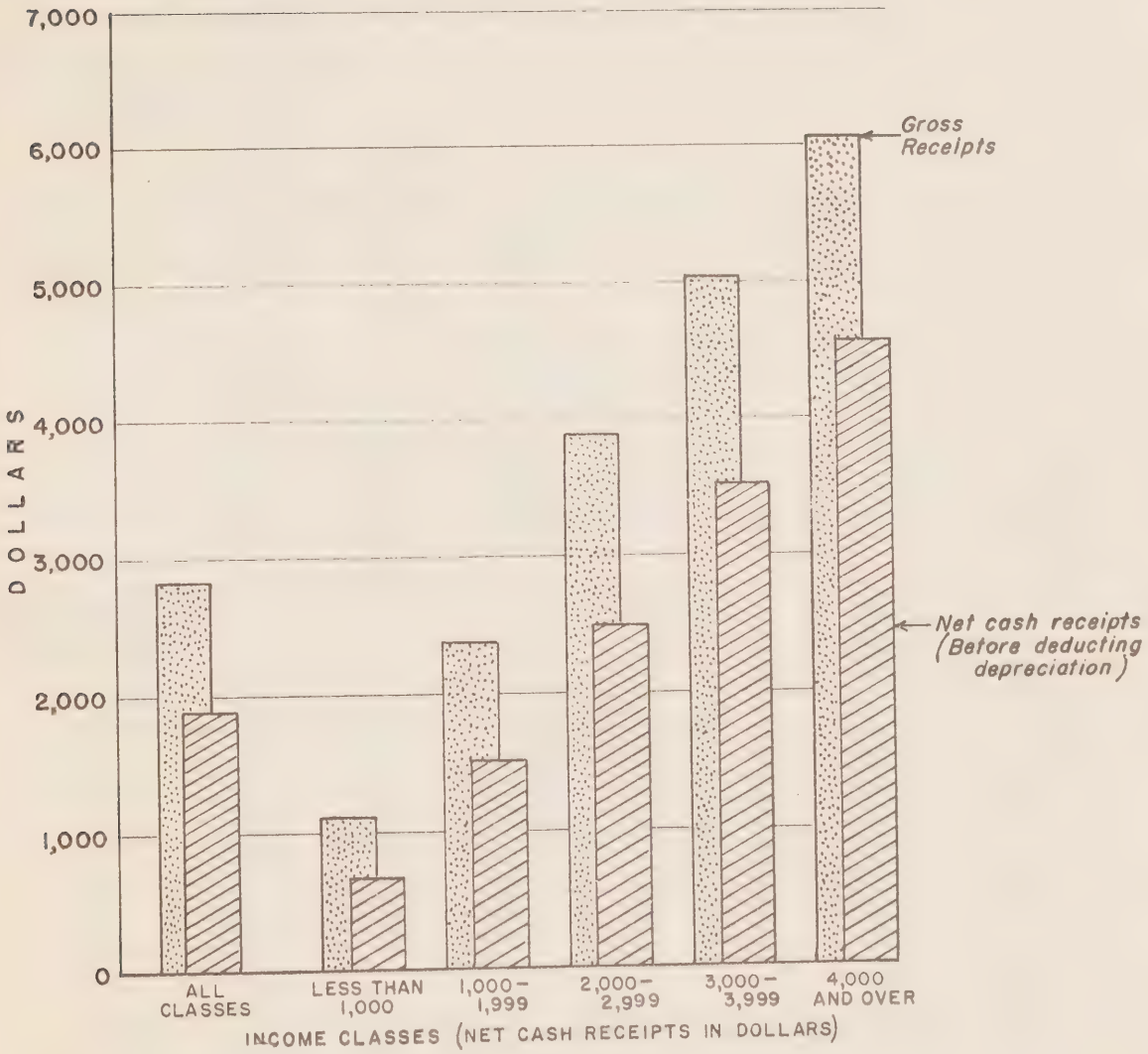
CHART I: SALMON GILLNET FISHERMEN, RELATION OF NET INCOME TO GROSS RECEIPTS, BY INCOME CLASS



TWO-YEAR AVERAGES OF : (a) RECEIPTS AND (b) COSTS AND NET INCOME PER DOLLAR OF GROSS FISHING RECEIPTS FOR 64 FISHERMEN, BY INCOME CLASS, BRITISH COLUMBIA, 1953 AND 1954

H.P. MAY

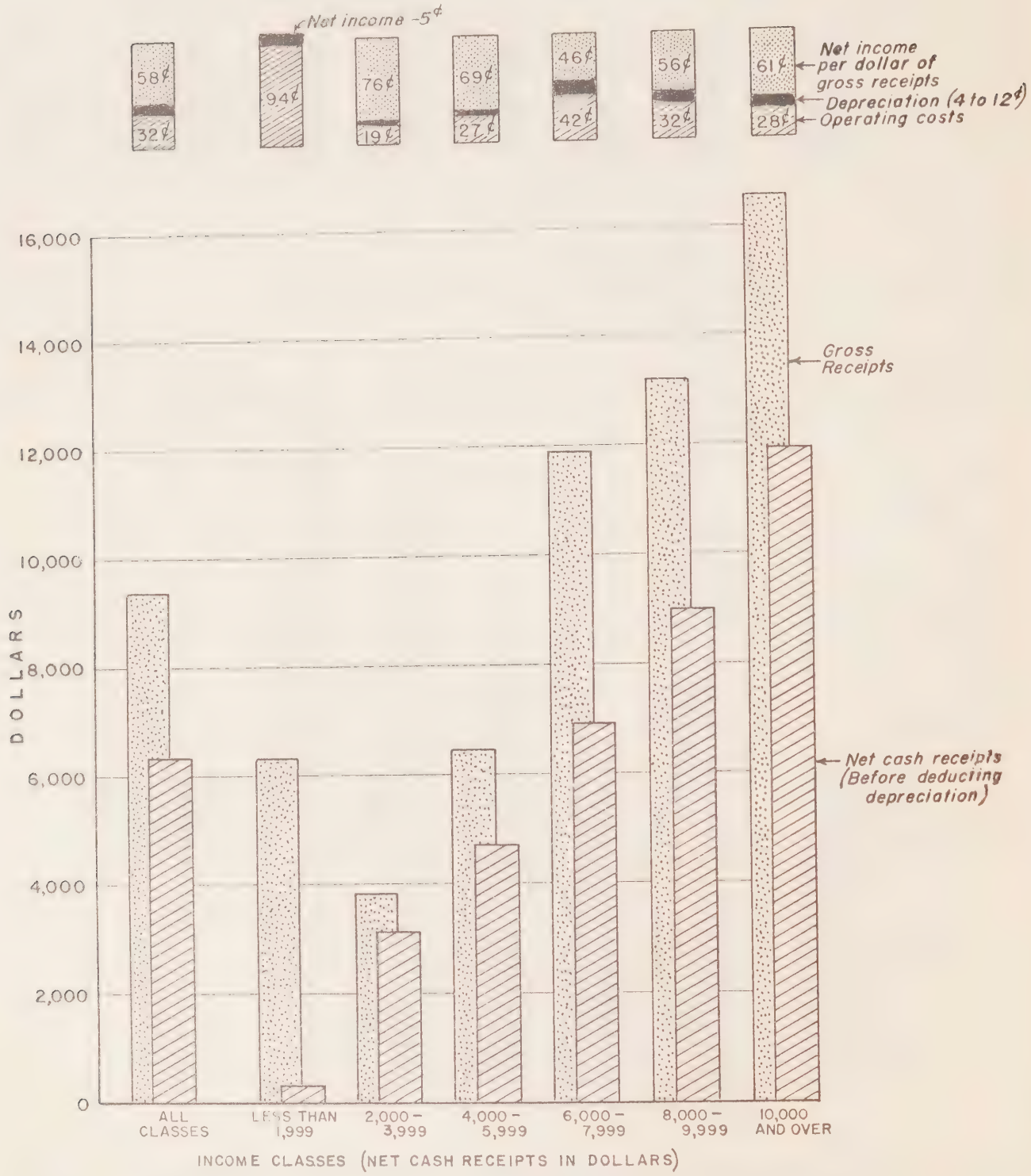
CHART 2: SALMON TROLL FISHERMEN, RELATION OF NET INCOME TO GROSS RECEIPTS, BY INCOME CLASS



TWO-YEAR AVERAGES OF: (a) RECEIPTS AND (b) COSTS AND NET INCOME PER DOLLAR OF GROSS FISHING RECEIPTS FOR 51 FISHERMEN, BY INCOME CLASS, BRITISH COLUMBIA, 1953 AND 1954

H.P. MAY

CHART 3: SALMON SEINE CAPTAINS, RELATION OF NET INCOME TO GROSS RECEIPTS, BY INCOME CLASS



TWO-YEAR AVERAGES OF; (a) RECEIPTS AND (b) COSTS AND NET INCOME PER DOLLAR OF GROSS FISHING RECEIPTS FOR 25 FISHERMEN, BY INCOME CLASS, BRITISH COLUMBIA, 1953 AND 1954

H.P. MAY

(d) Factors Related to Income Variations

Apart from the prices for salmon and the more intangible factors such as fishermen's skill,[1] the following factors influence the level of fishermen's incomes:

(1) the size of boat,
(2) the total value of capital equipment,
(3) the number of days spent fishing,
(4) the areas where fishing is carried out.

These factors are interrelated to a great extent. It is obvious that the value of capital equipment would be related to the size of boat, and that both of these factors are related to the number of days afloat and the areas fished, as the larger and more seaworthy boats can range over greater distances. By classifying the four types of salmon fishermen under these separate factors, however, it was found that certain factors have a greater influence on the incomes of some fishermen than they have on others. The length of boats used by gillnetters, for example, was more standardized and showed less relation to fishermen's incomes than the length of boats used by seine fishermen. On the other hand, a classification by areas fished showed more relative difference in the incomes among gillnetters than among seine fishermen.[2]

If fishermen are grouped in classes in accordance with their net receipts, a comparison of the related factors can be made (Table 23). The net cash receipts from fishing are taken as the common denominator in this comparison as they reflect the results of most factors which combine to produce the variations evident in fishermen's incomes. The following analysis is restricted to an examination of the variation in fishermen's net cash receipts and the related factors of capital, boat size, and number of days afloat.

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1 Fishermen's skill is probably affected by age, more than by any other factor. In 1954, the two largest groups of salmon fishermen interviewed (gillnet and troll fishermen) averaged 44 and 49 years of age, respectively. In classifying these fishermen's incomes by age groupings, it was found that net cash receipts from fishing were highest for the 20 to 39 and 40 to 59 age classes. Among troll fishermen, the 20 to 39 age class, particularly, reported higher net receipts. The average for this group was nearly $1,000 above the averages for all other age classes of troll fishermen.

2 Tables showing the classifications of different types of salmon fishermen by these factors were provided in detail in the 1953 interim report. The records obtained in 1954, when classified, showed a similar relationship between fishermen's incomes and the above factors.

Table 23

Frequency Distribution of Net Cash Fishing Receipts of 172 Salmon Fishermen, with Value of Fishing Capital, Length of Boat and Number of Days Afloat of Each Class, Two-year Averages by Type of Fishermen, British Columbia, 1953 and 1954

Distribution of Net Cash Receipts	Number of Fishermen	Value of Fishing Capital	Overall Length of Boat	Number of Days Afloat	Net Cash Receipts
	(Two-year averages)				
	No.	$	Feet	No.	$
64 Gillnetters					
Less than $1,000	20	2,294	28	61	634
$1,000 - 1,999	20	2,892	30	79	1,531
2,000 - 2,999	9	4,126	31	95	2,372
3,000 - 3,999	9	5,865	33	104	3,392
4,000 & Over	6	7,367	34	106	4,775
51 Trollers					
Less than $1,000	17	2,672	30	81	679
$1,000 - 1,999	15	4,928	35	85	1,525
2,000 - 2,999	9	6,012	36	112	2,502
3,000 - 3,999	6	9,524	39	106	3,541
4,000 & Over	4	7,164	34	104	4,562
32 Seine Assistants					
Less than $1,000	3	-	45	59	745
$1,000 - 1,999	14	32	53	59	1,500
2,000 - 2,999	9	889	52	71	2,352
3,000 - 3,999	1	-	48	68	3,395
4,000 & Over	5	2,855	67	124	6,447
25 Seine Captains					
Less than $2,000	1	14,240	49	102	342
$2,000 - 3,999	6	4,352	49	72	3,127
4,000 - 5,999	6	6,063	54	92	4,707
6,000 - 7,999	4	27,482	58	88	6,935
8,000 - 9,999	4	30,162	55	78	8,963
10,000 & Over	4	29,809	64	137	11,917

Note: The figures shown opposite each receipt class are two-year averages. To be included in a net receipt class of $4,000 and over, a gillnet fisherman, for example, would have had net receipts averaging $4,000 or over in 1953 and 1954.

For the sample of gillnet fishermen, the relationship of the various factors to net receipts is very clear, because the value of capital equipment, size of boat, and number of days afloat increase in order of increased receipts. For the 51 troll fishermen, although the records show a general trend towards increased receipts with larger boats, more valuable equipment and more days afloat, it will be noted that those with the highest net receipts operated boats which were considerably smaller in size, and also that the number of days afloat was slightly less than reported by some of the troll fishermen who had lower net receipts. The main reason for this reversal in the general trend, was that the larger boats, which averaged 39 feet in length, required more crew help than the four boats which averaged 34 feet in length. Of the six fishermen on larger boats, four had additional crew help during the salmon season, and consequently had to share the catch.[1] Of the four fishermen on the smaller boats, who showed the highest net receipts, only one had an additional part-time assistant.

Seine fishermen's records also showed the significant relation of boat size and number of days fished, to net receipts. Capital equipment was an important factor and it will be noted that the two groups of seine captains who had the highest receipts owned fishing capital valued at about $30,000 per fisherman.[2] Among the 12 seine captains in the lowest net receipt classes of $2,000 to $5,999, all except one operated company boats and consequently the value of their capital equipment was low. For both seine assistants and captains it will be noted that fishermen with the highest receipts reported a significantly higher number of days afloat than all other seine fishermen. The reason for this sharp difference is that all of the top seine fishermen, with the exception of one assistant, fished herring and halibut, as well as salmon, in both survey years.[3]

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1 If depreciation is deducted from the net cash receipts shown in Table 23 (i.e., average depreciation of $665 for the 39 foot trollers compared with $514 for the 34 foot boats), this leaves average net income from fishing of $2,876 and $4,048 for fishermen operating the 39 and 34 foot trollers, respectively. This is one instance where smaller, lower valued boats apparently yield higher net incomes.

2 In the group of four captains who had net receipts of $10,000 and over, two were only part-owners of the seine vessels. Thus the average value of their fishing capital was slightly lower than that of the captains with net receipts of $8,000 - $9,999.

3 The assistant who did not fish herring and halibut, owned a seine boat. The charter receipts from this boat, when added to the crew share, placed this assistant in the high income group.

For all types of salmon fishermen it is clear that the variation in value of capital equipment is one of the major factors influencing the wide differences in fishermen's net incomes.[1] Even among seine assistants, it is evident from the relation of net receipts to boat length, that capital is an important factor. In reaching this conclusion, it must be conceded (as stated above) that the factors which determine incomes are complex and interrelated. It will be noted that the analysis shown in Table 23 does not include comparisons of areas fished by these salmon fishermen. While this is an important factor, it is more difficult to relate it to fishing incomes in a general survey of this nature, because the length of time spent in any given area varies between different fishermen. In British Columbia, however, the more experienced salmon fishermen range widely over all areas and therefore the area factor is not a limiting one.

(e) Relation of Boat Size to Seine Fishermen's Net Crew Shares

Due to the relative complexity of salmon seine operations, in which additional income, such as captain's bonuses and fish commissions, can considerably alter fishermen's total earnings, a further analysis is made of the relation of boat length to net crew shares (Table 24). The crew shares and number of days afloat are for salmon fishing only, from the table-seine type of boat.

A comparison of net crew shares per day afloat indicates the importance of boat size. The seine fishermen on boats of over 55 feet in length averaged $7 more per day than those on smaller boats in 1953, and $15 more in 1954. Taking an average of the two years, the fishermen on larger boats received $31 per day compared with $21 for those fishermen on smaller boats.

In this comparison, expenses for fishing clothing and licence fees are not deducted in arriving at net crew shares. These are personal expenses and they have no relation to the size of boat. The records taken from both captains and assistant crew men were used in this analysis because the captains and assistants share equally in the crew share of receipts and expenses.

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1 Simple correlation measurements indicate a positive relationship between the value of fishing capital and average net cash receipts per day afloat. For 59 gillnet fishermen interviewed in 1953 and 1954, the correlation coefficient for capital and receipts was +0.49. For 49 troll fishermen interviewed in these two years the correlation coefficient for capital and receipts was +0.54.

Table 24

Relation of Boat Length to Gross and Net Salmon Crew Shares of 34 Seine Fishermen, British Columbia, 1953 and 1954

	(Boat length, overall in feet)			
	Less than 55		Over 55	
	1953	1954	1953	1954
Number of fishermen	18	18	16	16
Average boat length (feet)	49	49	62	62
Average days afloat (number)	63	52	72	58
	$	$	$	$
Average gross crew share	1,426	1,422	2,147	2,502
Average crew expenses				
Fuel	73	67	88	74
Food	164	162	212	215
Total	237	229	300	289
Average net crew share	1,189	1,193	1,847	2,213
Average net crew share per day afloat	19	23	26	38

Note: The above study was restricted to records of fishermen who had operated on table-seiners, and had been crew members on the same boats in both 1953 and 1954. The 34 records were taken from 19 captains and 15 assistants. As the average length of all 34 boats was 55 feet, the division into two classes was for those boats below and above the average size. There were no 55 foot boats in these two groups. In Table 24, only crew shares are shown. No bonuses or commissions are included as these shares were taken from the 7/11ths portion of the gross salmon stock which is allocated to the crew.

A distribution of the values of salmon landed by all British Columbia seiners in 1954 shows the wide differences among boats, in the value of fish caught (Appendix B, Table A-15). The variation revealed in this distribution provides further confirmation of the variation in fishermen's incomes found during the course of this study.[1]

Of the 508 boats operating in 1954, 90 had gross landings of less than $5,001 and an additional 75 reported landings of $5,001 to $10,000. These two groups with the lowest value of landings formed nearly one-third of all seine boats operating but they accounted for only 9.3 per cent of the total value of salmon caught. On the other hand, boats with landings of $20,001 or more caught 60.8 per cent of the total value but the number of boats included in these groups was only 32.8 per cent of the total in the seine fleet.

A further analysis of salmon species caught by seine in 1954 revealed that boats which had high earnings had a significantly higher proportion of sockeye receipts. While sockeye accounted for only 45 per cent of the total value of salmon taken by all seiners, it made up over 60 per cent of the receipts of seiners landing $30,001 to $35,000 worth of salmon, and over 85 per cent of the receipts of the top seiners, i.e., those landing over $45,000 worth of salmon.

7. Principal Conclusions

In general, salmon fishermen enjoy a number of advantages over other Canadian fishermen, and as a result of these advantages their fishing incomes are relatively high. This is indicated by the net fishing receipts per day afloat which averaged from $20 to $79, per man, for different types of salmon fishermen surveyed in 1953 and 1954, and by the average annual incomes received from fishing and other sources. The group averages for net cash income received by the four types of salmon fishermen ranged from $2,437 to $7,303 in these two years.

Despite the favourable incomes shown by the averages for all salmon fishermen in these two years, this primary industry is vulnerable to sharp income fluctuations due, mainly, to the changing quantities of different salmon species caught and corresponding changes in the total value of salmon. Although the net incomes of

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1 The gross value per boat, as shown by these overall statistics, was also useful in a comparison with the average gross value or "gross stock" for seine boats included in the survey. This comparison is made in Appendix D, under Size and Representativeness of Survey Samples.

all salmon fishermen surveyed changed by only 11 per cent in 1953 and 1954, the values of total British Columbia salmon landings in these years were close to the 1949-55, seven-year average. The values of salmon landings for other recent years (1951 and 1952, in particular,) reveal that the aggregate net income of all British Columbia salmon fishermen may fluctuate greatly from one year to the next.

There are wide differences among salmon fishermen's incomes in any given year. After deducting operating costs, net cash fishing receipts of fishermen interviewed in 1953 ranged from a loss of $1,125 to a gain of $14,455. In 1954, they ranged from $51 to $15,746. These differences are primarily due to the different methods of fishing and the wide differences in the value and efficiency of equipment used by fishermen. Although the number of days spent fishing has an important influence on the level of incomes and is related to the variation in income among individual fishermen, the survey showed that the four different types of salmon fishermen averaged about the same length of time afloat. Other factors such as skill and age of fishermen are also important, but these are more difficult to measure.

From the analysis of capital fishing equipment in relation to incomes, it was shown that fishermen in the higher income classes were those who were better equipped in terms of boat size and boat and gear values. There was little indication, from the results of this survey, that it does not pay to invest in higher valued fishing equipment. Seine boat owners who had an average of about $30,000 in fishing capital, including boats and gear, had the highest incomes of all fishermen interviewed, despite the necessary allowances for high capital costs in depreciation and interest on investment.[1] This conclusion, however, applies to salmon fishermen as individuals. Whether salmon fishermen, considered collectively, have either too little or too much capital equipment in relation to the present available stock of salmon and the profitability of fishing it, is an entirely different matter. It was not intended to deal with that question in this study.

Comparing the average net incomes from fishing for the four types of salmon fishermen, it may be concluded that troller fishermen had the lowest incomes, considering the amount of time spent fishing and the capital equipment involved (see Tables 9 and 14). Seine assistants receive higher incomes in view of these same

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1. This does not imply that there is no upper limit to the profitable application of capital. The principle of diminishing returns applies, as it does to the other production factors - i.e., labour and management. The study indicates, nevertheless, that there is still a considerable number of salmon fishermen who do not have sufficient capital equipment.

considerations, but their higher incomes are due, mainly, to the more efficient methods used in seine fishing. As for gillnet fishermen, their net incomes averaged slightly higher than those of troller fishermen but gillnetters had to meet significantly higher operating expenses. In relation to total gross receipts, gillnet fishermen had the highest operating expenses of all types of salmon fishermen and because of this high ratio, gillnet fishermen's net incomes are subject to wider fluctuations from year to year. Furthermore, gillnet fishermen rely on the same species of salmon as seine fishermen, and they must compete with the seine method of fishing. On the other hand, troller fishermen are a more independent group, relying on different species of salmon and also different markets than those of other types of fishermen.

Among other comparisons made between types of salmon fishermen, the survey showed that seine captains received significant earnings in the form of fish commissions (based on the quantity of fish delivered) and also other additional bonuses. These additional receipts amounted to nearly 10 per cent of all seine captains' gross receipts.

Income received from sources outside the fishing industry provided a significant portion of the total income available for gillnet, troll, and assistant seine fishermen. For seine captains, however, although non-fishery income averaged over $500 per fisherman in both survey years, it amounted to only eight per cent of their net cash income from all sources. A comparison of non-fishery income with the distribution of net cash fishing receipts, showed that fishermen who had lower receipts from fishing did not always earn more from non-fishery sources than those with higher fishing receipts. In other words, there was no consistent relationship between the amount of income received from fishing and supplementary income from other sources. A further analysis of the distribution of non-fishery income by the three fishing districts in British Columbia, showed that fishermen residing in District 3 (Vancouver Island and the middle-region of the province) had the highest average incomes from non-fishery sources, followed by fishermen living in District 1 (the Fraser River area and southern part of the province). Those living in the northern area in District 2 had considerably lower incomes. Apparently, the level of income from alternative occupations is related to the opportunity to earn this income in areas where fishermen reside. Although it has been stressed in this report that many salmon fishermen travel extensively over the entire coast during the fishing season, it is concluded that after the season is over they tend to look for alternative sources of work closer to their homes.

It has been shown that one of the most difficult problems in this primary industry is that of changes in annual salmon runs and the consequent instability of fishermen's incomes. If it is possible to provide more accurate predictions of

future salmon runs ahead of the production year, fishermen may, at least partially, solve this problem. If a very poor run was predicted, some of the more transient fishermen might plan to leave the fishery for the season and seek employment in a different industry. Fishermen could also restrict their pre-season expenditures on salmon gear and prepare for more intensive fishing of other species in poor salmon years. As slightly more than half of the salmon fishermen interviewed in 1953 and 1954 were dependent on salmon fishing alone, it is evident that the tendency towards diversification in fishing is still far from universal in British Columbia. With the increased versatility of boats and fishing equipment in recent years, however, there is little doubt that more fishermen are moving towards diversified operations. Although there is a limit to the number of fishermen who can profitably take part in the herring and halibut fisheries, there are groundfish and shellfish in British Columbia coastal waters that are not being exploited to their maximum potential because of the present insufficient demand. There is also the possibility that offshore exploration will result in profitable fishing of tuna and other species. Future development of these activities may provide a more diversified fishing industry in British Columbia, and this could enable fishermen to profitably extend the period of their fishing operations each year.

APPENDICES

APPENDIX A

Terminology

The abbreviated terms used in the accounting of fishermen's incomes in this report are almost identical to those used in the interim report on the economic survey of salmon fishermen for 1953. The tabulation of data pertaining to all items of receipts and expenditures followed the procedure used in the earlier report to facilitate reading and comparison of these survey reports.

The definitions of the more important terms are as follows:

Days Engaged in Fishing Operations

This term is used to denote the total time that the fisherman is occupied in primary fishing operations. During this time he will normally not be available to undertake other forms of employment of a continuing nature. It is intended to include the time spent overhauling boats and repairing and mending fishing gear, together with all duties associated with his actual fishing operations. It does not include the time spent collecting or packing fish, working in fish plants or other work which might be associated with the secondary fishing industry.

Days Afloat

This term is used to denote the time spent afloat and will include the time actually spent fishing as well as the time spent travelling to and from the fishing grounds. It does not, however, include time when the boat is tied up during week-end closures.

Fishing Capital

The capital values shown for boats, fishing gear and shore equipment, are the estimated market values at the end of the fishing year.

Boats: The value of boats includes the hulls, engines and all electronic equipment and fixed gear. If the boat is owned on a partnership basis only the value of the individual's portion is shown.

Fishing Gear: This includes the value of all fishing gear. For the 1953 survey, the value of gear was listed at its estimated peak value when it was prepared for fishing. In 1954, however, the end of year values were listed. This change in listing gear inventory did not affect two-year comparisons of most fishermen's equipment, but in the case of gillnet gear, much of the equipment is fully depreciated in one year and the 1953 inventory values were considerably higher than those listed in 1954. All gear costs have been considered as current expenses and no depreciation has been allowed.

Shore Equipment: This item includes private floats, wharves, net houses and other private shore equipment.

Fishing and Fishery Receipts:

Salmon Salmon receipts are itemized by species and where possible were obtained from copies of sales slips or company settlement statements. Sales made direct to consumers or retailers were estimated by fishermen and are included in the total receipts. The value of fish consumed or given away was not regarded as a cash receipt and was not accounted as income.

In cases where there was more than one person in the crew to share the receipts, a crew settlement statement was obtained and a proportion of gross value of the catch to which he was entitled was pro rated to the fisherman being enumerated.

Other Fish Includes gross cash receipts for all other fish in the same way as mentioned for salmon. This includes receipts for halibut, herring, grey cod, shell fish and other miscellaneous species.

Collecting Includes net receipts from collecting and packing fish.

Other Fishery Receipts Includes net wages earned in the fishing industry, such as wages for work in fish plants.

Boat and Vessel Charter Receipts All boat charters received by fishermen for salmon and herring charters, in lieu of the usual boat shares. When a boat is chartered all costs incurred as repairs are the responsibility of the owner and are included in expenses, if the owner was one of the fishermen interviewed.

Total Cash Operating Receipts

This item includes all cash from fishing and other fishery receipts before deducting any expenses directly chargeable to the year's fishing operation. It does not include the sale of capital fishing equipment or fishing loans obtained during the year.

Fishing Expenses:

Expenses listed here include all cash costs which must be deducted from gross operating receipts to arrive at a net cash income from fishing.

In cases where more than one person shares the expenses they are treated on the same basis as receipts.

A brief description of each of the expense items follows:

Fuel and Oil — Includes gas, diesel oil, lubricating oil and stove fuel.

Bait and Ice — Includes only fresh or frozen bait together with any ice actually bought to be used for icing fish.

Catching Material and Repairs — Includes the cost of all material and labour used in maintaining or repairing fishing gear. This section does not include gillnets purchased during the year but in all other cases includes cost of gear purchased.

Gillnet Purchases — Includes only the cost of complete gillnets purchased during the year.

Hull Painting and Repairs — Includes both material and labour costs in overhauling and painting the hull and all boat-way charges.

Engine and Equipment — Includes both parts and paid labour costs that go into the maintenance of engines and other boat equipment.

Fish Clothes — Includes only special protective clothing required in the fishing operation. This does not include the cost of regular clothing worn while fishing.

Wages Paid — Includes actual wages paid to assistants in cases where the amount paid is not influenced by the catch. The normal crew shares are not shown as an expense to the individual fisherman.

Taxes, License Fees, Transportation, Etc. — Taxes included under this expense are of a minor nature only and include such direct taxes chargeable to the gross receipts as custom duties on fish (mostly halibut) exported to the United States. Income tax, property tax, etc., are not taken as a direct expense against fishing receipts. License fees include the cost of all fishing licenses purchased. Transportation costs include actual amounts paid out for travel by the fishermen in connection with the fishing operation.

Insurance — The cost of insurance on boats and gear including shark damage insurance.

Interest — Includes actual interest paid during the year on outstanding fishing debts.

Rentals — Includes rental paid by fishermen for either boats or gear.

Other Expenses — Includes all other items of a miscellaneous nature that are chargeable to the fishing operation and that can be regarded as fishery expenses. Such items as bluestone, rope lines, etc., would be included in this item.

Total Cash Operating Expenses

This item is the total of all cash expenses directly chargeable to the current year's fishing operation.

Net Cash Operating Receipts

This item is arrived at by deducting the total cash operating expenses from the total cash operating receipts. This is the net cash income from the year's fishing operation, before making any allowance for depreciation on fishing capital. Neither capital expenditures nor receipts have been considered in arriving at net cash operating receipts.

Income From Other Occupations:

This item includes net income earned by the fisherman from other occupations and in such cases it is intended to cover only "take home pay".

Social Security

Includes receipts of family allowances, pensions, relief, e.g. from the Department of Indian Affairs, and unemployment insurance benefits.

Other Income

This item includes income received on investment capital and amounts earned and paid by other members of the family to the upkeep of the household.

Non-fishery Income

This is the total of the three items mentioned above and represents the current income received by the fisherman from sources other than fisheries. It does not, however, include loans received, or any capital receipts or expenditures.

Total Net Income

This total is the net cash operating receipts from fishing plus non-fishery income.

Net Income Less Depreciation

Depreciation has been allowed on all fishing capital in boats and shore equipment where it was an item chargeable against the fisherman. Depreciation was calculated on hulls, engines and electronic equipment separately, and consideration was given to age in each case in determining the depreciation allowance.

APPENDIX B

Tables and Charts

Table A-1

Gillnet Fishermen's Operations, Receipts, Expenses and Non-fishery Income - Averages, Range in Items and Number Reporting Items, British Columbia, 1953 and 1954

		1953			1954		
No. of fishermen		64			64		
		Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Days engaged in fishing							
Operations	days	166	37 - 279	64	173	42 - 308	64
Afloat	days	80	20 - 183	64	83	19 - 201	64
Length of boat (overall)	feet	30	14 - 36	64	31	14 - 36	64
Fishing capital	dollars	3,825	200 - 11,516	60	3,608	150 - 11,050	62
Cash operating receipts		$	$	No.	$	$	No.
Sockeye		1,828	524 - 5,097	64	1,964	116 - 6,767	63
Spring		202	3 - 1,197	59	230	6 - 1,079	63
Coho		148	1 - 908	63	182	8 - 1,413	62
Pink		316	1 - 2,300	62	170	3 - 941	35
Chum		457	2 - 2,082	58	652	2 - 3,807	64
Other		11	1 - 116	47	20	1 - 138	55
Total salmon		2,962	587 - 8,246	64	3,218	535 - 10,220	64
Other fish		189	2 - 2,075	28	155	2 - 1,397	28
Collecting		51	470 - 2,800	2	61	120 - 2,585	4
Other fishery receipts		36	220 - 1,071	3	63	115 - 2,239	6
Chartering boats		1	- - 20	1	2	- - 161	1
Total		3,239	744 - 8,246	64	3,499	668 - 10,220	64

Table A-1 (Continued)

No. of fishermen	1953 64			1954 64		
	Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Cash operating expenses	$	$	No.	$	$	No.
Fuel and oil	284	18 - 745	64	295	15 - 1,005	64
Bait and ice	10	6 - 195	10	8	3 - 141	9
Gear material and repairs	161	9 - 1,137	62	136	3 - 726	52
Gillnet purchases	666	100 - 2,200	56	614	50 - 2,249	53
Hull painting and repairs	55	4 - 253	58	78	4 - 409	58
Engine and equipment repairs	80	3 - 378	57	113	3 - 568	58
Fish clothes	24	1 - 100	50	22	3 - 150	51
Wages paid	13	12 - 300	7	6	25 - 158	4
Taxes, licence fees, etc.	24	1 - 212	64	25	1 - 131	64
Insurance	42	3 - 334	37	39	6 - 269	37
Interest	4	15 - 144	4	37	13 - 310	19
Rentals	46	4 - 580	20	61	5 - 701	15
Other	13	1 - 255	33	12	1 - 220	18
Total	1,422	218 - 3,825	64	1,446	213 - 4,029	64
Net cash operating receipts	1,817	-580 - 5,941	64	2,053	208 - 6,722	64
Non-fishery income						
Other occupations	571	3 - 4,982	37	460	15 - 4,500	27
Social security	106	11 - 1,008	38	129	24 - 1,152	38
Other income	162	5 - 2,500	17	166	15 - 2,040	17
Total	839	60 - 5,894	55	755	55 - 5,352	51
Total net cash income	2,656	-112 - 7,985	64	2,808	339 - 8,006	64
Depreciation on fishing capital	220	12 - 791	60	212	11 - 692	60
Net income less depreciation	2,436	-531 - 7,555	64	2,596	-182 - 7,545	64

Table A-2

Troll Fishermen's Operations, Receipts, Expenses and Non-fishery Income - Averages, Range in Items and Number Reporting Items, British Columbia, 1953 and 1954

		1953			1954		
No. of fishermen		51			51		
		Average (All Fishermen)	Range for those Reporting	No Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Days engaged in fishing							
Operations	days	174	72 - 354	51	166	51 - 339	51
Afloat	days	98	28 - 236	51	87	19 - 210	51
Length of boat (overall)	feet	34	12 - 44	51	34	12 - 44	51
Fishing capital	dollars	5,152	60 - 14,244	51	5,015	165 - 13,580	51
Cash operating receipts		$	$	No.	$	$	No.
Sockeye		6	1 - 162	19	35	1 - 566	24
Spring		1,296	40 - 6,164	51	1,008	9 - 4,149	50
Coho		1,326	75 - 4,461	50	1,273	6 - 3,550	51
Pink		52	1 - 551	35	22	1 - 530	25
Chum		93	1 - 1,117	23	131	1 - 1,486	20
Other		1	1 - 11	10	1	1 - 15	13
Total salmon		2,774	301 - 7,780	51	2,470	289 - 6,450	51
Other fish		113	1 - 1,145	25	206	1 - 1,649	35
Other fishery receipts		10	50 - 250	4	49	381 - 822	4
Chartering boats		13	65 - 500	3	30	15 - 650	4
Total		2,910	301 - 7,785	51	2,755	351 - 6,646	51

Table A-2 (Continued)

	1953			1954		
No. of fishermen	51			51		
	Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Cash operating expenses	$	$	No.	$	$	No.
Fuel and oil	336	37 - 884	50	296	20 - 837	51
Bait and ice	21	5 - 210	15	27	5 - 190	19
Gear material and repairs	242	15 - 858	51	214	12 - 785	51
Hull painting and repairs	100	10 - 752	50	93	12 - 551	49
Engine and equipment repairs	79	7 - 255	45	101	2 - 653	45
Fish clothes	33	2 - 140	41	23	2 - 137	39
Wages paid	33	100 - 890	4	18	2 - 395	6
Taxes, licence fees, etc.	24	1 - 206	51	27	1 - 401	51
Insurance	74	22 - 830	22	75	28 - 900	25
Interest	12	14 - 140	8	24	15 - 275	15
Rentals	3	20 - 50	6	5	12 - 70	7
Other	18	2 - 173	31	5	3 - 50	14
Total	975	53 - 3,067	51	908	73 - 3,197	51
Net cash operating receipts	1,935	119 - 5,778	51	1,847	51 - 5,411	51
Non-fishery income						
Other occupations	356	8 - 2,100	24	233	45 - 1,670	23
Social security	142	60 - 980	26	116	26 - 612	28
Other income	100	10 - 2,000	14	241	17 - 3,600	16
Total	598	17 - 2,304	40	590	17 - 3,600	41
Total net cash income	2,533	217 - 6,143	51	2,437	239 - 6,421	51
Depreciation on fishing capital	336	2 - 979	51	334	9 - 976	51
Net income less depreciation	2,197	75 - 5,667	51	2,103	-226 - 5,951	51

Table A-3

Seine Assistants' Operations, Receipts, Expenses and Non-fishery Income-
Averages, Range in Items and Number Reporting Items, British Columbia, 1953 and 1954

		1953			1954		
No. of fishermen		32			32		
		Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Days engaged in fishing							
Operations	days	130	51 - 209	32	126	40 - 215	32
Afloat	days	74	32 - 136	32	71	18 - 172	32
Length of boat (overall)	feet	55	36 - 76	32	54	37 - 78	32
Fishing capital	dollars	738	50 - 15,775	4	682	40 - 12,775	5
Cash operating receipts		$	$	No.	$	$	No.
Sockeye		345	14 - 1,878	32	739	1 - 3,206	32
Spring		16	1 - 228	27	8	1 - 38	30
Coho		114	12 - 516	30	109	7 - 360	32
Pink		763	68 - 2,107	30	326	1 - 1,928	30
Chum		527	3 - 1,326	32	782	3 - 2,435	32
Other		6	1 - 72	18	2	1 - 11	15
Total salmon		1,771	356 - 4,543	32	1,966	538 - 4,047	32
Other fish		570	134 - 4,714	11	740	209 - 6,384	11
Collecting		41	324 - 650	3	65	250 - 1,472	3
Other fishery receipts		43	50 - 705	4	104	11 - 2,125	8
Chartering vessels		193	100 - 6,072	2	143	- - 4,563	1
Total		2,618	473 - 9,001	32	3,018	538 - 9,430	32

Table A-3 (Continued)

	1953			1954		
No. of fishermen	32			32		
	Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Cash operating expenses	$	$	No.	$	$	No.
Fuel and oil	111	30 - 335	32	87	24 - 181	32
Bait and ice	32	8 - 348	9	31	25 - 249	7
Gear material and repairs	23	2 - 172	11	33	30 - 221	9
Hull painting and repairs	14	35 - 260	3	12	22 - 351	2
Engine and equipment repairs	5	57 - 100	2	13	4 - 351	6
Fish clothes	44	15 - 200	25	52	8 - 108	32
Taxes, licence fees, etc.	33	1 - 152	32	52	1 - 231	32
Insurance	27	- - 875	1	30	15 - 922	3
Interest	9	- - 297	1	23	- - 741	1
Rentals	1	8 - 25	2	-	- - -	-
Other	1	2 - 14	3	1	3 - 15	5
Total	300	31 - 1,787	32	334	82 - 2,650	32
Net cash operating receipts	2,318	433 - 8,121	32	2,684	443 - 8,563	32
Non-fishery income						
Other occupations	551	25 - 2,654	21	407	24 - 1,700	18
Social security	118	60 - 972	17	108	120 - 565	13
Other income	89	25 - 1,500	8	203	200 - 2,880	5
Total	758	25 - 2,714	24	718	24 - 4,200	20
Total net cash income	3,076	468 - 8,309	32	3,402	443 - 8,963	32
Depreciation on fishing capital	47	495 - 1,026	2	48	520 - 1,026	2
Net income less depreciation	3,029	468 - 8,146	32	3,354	443 - 8,963	32

Table A-4

Seine Captains' Operations, Receipts, Expenses and Non-fishery Income - Averages, Range in Items and Number Reporting Items, British Columbia, 1953 and 1954

		1953			1954		
No. of fishermen		25			25		
		Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Days engaged in fishing							
Operations	days	175	92 - 261	25	182	80 - 340	25
Afloat	days	98	51 - 154	25	86	40 - 205	25
Length of boat (overall)	feet	55	40 - 78	25	55	40 - 78	25
Fishing capital	dollars	16,283	3,000 - 46,625	19	17,840	3,000 - 55,400	20
Cash operating receipts		$	$	No.	$	$	No.
Sockeye		972	28 - 3,147	25	2,093	7 - 6,893	25
Spring		112	3 - 1,901	22	28	1 - 129	24
Coho		301	22 - 765	25	270	44 - 681	25
Pink		2,517	187 - 8,409	25	1,272	8 - 4,755	23
Chum		1,947	4 - 6,044	25	2,634	1 - 8,273	25
Other		8	1 - 50	17	9	1 - 53	14
Total salmon		5,857	1,214 - 15,727	25	6,306	2,085 - 11,747	25
Other fish		1,309	150 - 8,071	16	1,540	326 - 15,679	15
Collecting		276	222 - 3,260	4	114	447 - 2,400	2
Other fishery receipts		156	165 - 1,169	6	170	20 - 1,376	9
Chartering vessels		1,343	1,400 - 7,114	9	1,702	300 - 7,185	11
Total		8,941	1,881 - 20,679	25	9,832	2,552 - 21,208	25

Table A-4 (Continued)

	1953			1954		
No. of fishermen	25			25		
	Average (All Fishermen)	Range for those Reporting	No. Reporting	Average (All Fishermen)	Range for those Reporting	No. Reporting
Cash operating expenses	$	$	No.	$	$	No.
Fuel and oil	378	74 - 1,125	25	260	66 - 508	25
Bait and ice	49	35 - 244	10	38	6 - 297	8
Gear material and repairs	1,041	34 - 2,677	22	1,095	17 - 2,543	20
Hull painting and repairs	451	20 - 2,747	13	404	47 - 2,378	14
Engine and equipment repairs	250	80 - 1,003	14	258	28 - 1,175	13
Fish clothes	73	40 - 160	22	58	35 - 150	23
Wages paid	34	15 - 600	4	5	- - 120	1
Taxes, licence fees, etc.	118	1 - 605	25	132	10 - 649	25
Insurance	441	9 - 1,380	15	554	15 - 2,700	17
Interest	181	156 - 1,500	6	209	144 - 1,663	8
Rentals	-	- - -	-	1	- - 19	1
Other	11	1 - 80	8	44	10 - 600	9
Total	3,027	268 - 6,534	25	3,058	181 - 7,024	25
Net cash operating receipts	5,914	-1,125 - 14,455	25	6,774	1,809 - 15,746	25
Non-fishery income						
Other occupations	175	20 - 1,420	6	125	300 - 825	6
Social security	162	60 - 528	20	167	25 - 584	21
Other income	186	6 - 2,400	8	237	150 - 2,110	8
Total	523	20 - 2,592	22	529	85 - 2,362	23
Total net cash income	6,437	-717 - 15,351	25	7,303	2,559 - 15,926	25
Depreciation on fishing capital	867	183 - 3,192	15	923	522 - 2,651	15
Net income less depreciation	5,570	-1,410 - 13,746	25	6,380	1,894 - 14,121	25

Table A-5

Income Distribution of Complete Samples of Salmon Fishermen Interviewed in British Columbia, 1953 and 1954

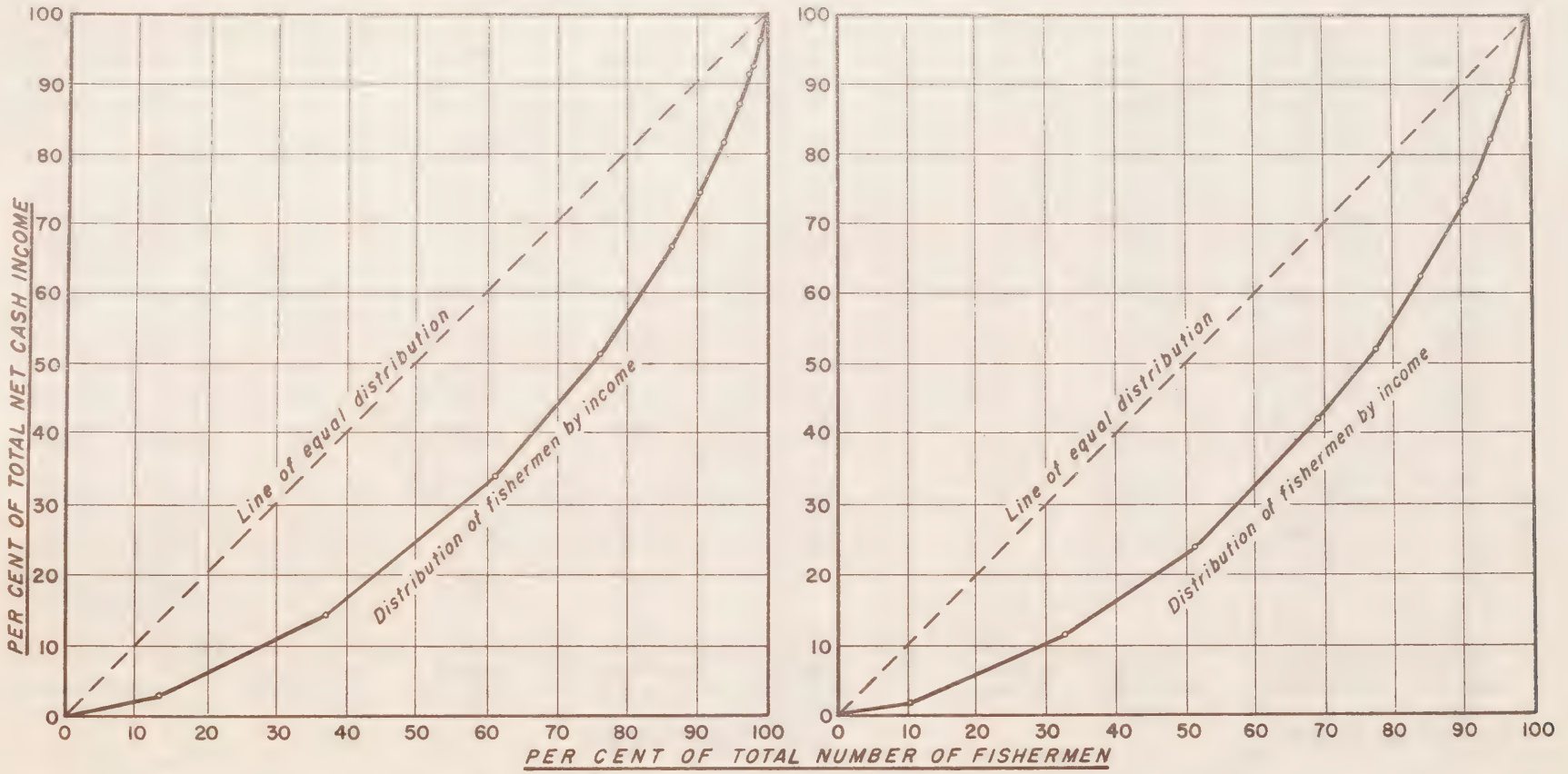
Income Class	1953 Number of Fishermen	1953 Total Net Cash Income	1953 Cumulative Per cent of Number of Fishermen	1953 Cumulative Per cent of Total Net Cash Income	1954 Number of Fishermen	1954 Total Net Cash Income	1954 Cumulative Per cent of Number of Fishermen	1954 Cumulative Per cent of Total Net Cash Income
$	No.	$	%	%	No.	$	%	%
Under - 1,000	35	17,663	13.2	2.2	27	16,170	10.5	1.7
1,000 - 1,999	64	93,048	37.3	14.0	57	85,933	32.8	11.0
2,000 - 2,999	64	155,325	61.4	33.7	47	117,596	51.2	23.7
3,000 - 3,999	40	137,818	76.4	51.2	47	167,897	69.6	41.8
4,000 - 4,999	27	119,058	86.5	66.3	21	94,119	77.8	52.0
5,000 - 5,999	11	61,726	90.6	74.2	17	93,524	84.4	62.1
6,000 - 6,999	9	56,722	94.0	81.4	16	102,783	90.7	73.2
7,000 - 7,999	6	44,453	96.2	87.1	4	29,653	92.3	76.4
8,000 - 8,999	4	32,933	97.7	91.3	6	51,528	94.6	81.9
9,000 - 9,999	1	9,313	98.1	92.5	7	65,842	97.3	89.0
10,000 - 10,999	3	31,044	99.2	96.5	1	10,198	97.7	90.1
11,000 and over	2	27,463	100.0	100.0	6	91,559	100.0	100.0
Total	266	786,566			256	926,802		

Note: Depreciation on fishing capital was not deducted from total net income and therefore this distribution shows only cash income. Net income includes all net receipts from fishing and sources outside the fishing industry.

CHARTS A-1 AND A-2:- PERCENTAGE DISTRIBUTION BY INCOME OF TOTAL SAMPLES OF SALMON FISHERMEN INTERVIEWED IN BRITISH COLUMBIA IN 1953 AND 1954

A-1: Distribution for 266 fishermen in 1953

A-2: Distribution for 256 fishermen in 1954



NOTE: Data from Table A-5

Drawn by H.P. May

Table A-6

Example of Salmon Seine Crew Settlement

In account with _____ Company's Name

Date _____

Captain_____ Seine Boat _____ Licence No._____

Owners net share		$12,000.00	Cannery_____
Captain's Bonus	1/8	1,500.00	Date of arrival_____
Balance		10,500.00	Date of Departure_____
Boat Earnings	2½/11	6,562.50	Boat owned or chartered by _____
Seine Earnings	1½/11	3,937.50	Seine supplied by _____
			No. in crew_____ Settled at _____
			Date settled _____

By 19,925	No. Sockeye	148,600 lbs.	.22	$32,692.00
158	Coho	1,636	.13	212.68
2	Pinks	8	.07¾	.62
922	Chums	10,044	.06¼	627.75
3	Red Springs	69	.13	8.97
3	White Springs	66	.08¼	5.44
2	Steelheads	18	.13	2.34
2	Jacks	-	.10	.20
			Gross Stock	$33,550.00

	Gross	Crew 7/11	Owners 4/11
	$33,550.00	$21,350.00	$12,200.00
Less Fuel and Lubricating Oil	550.00	350.00	200.00
Net Shares	33,000.00	21,000.00	12,000.00

Crew Names	Captain's Bonus	Crew Share	Less Food	Settlement
Captain_____	$1,500.00	$2,625.00	$100.00	$4,025.00
Assistants_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
_____		2,625.00	100.00	2,525.00
Total		$21,000.00	$800.00	$21,700.00

Table A-7

Example of Halibut Crew Settlement

In account with _____ Company's Name

Settled at _____

Boat _____ Captain _____ Date _____

LOST GEAR	$				$	
Items: _____			Gross Stock		30,509	00
			Less:		509	00
			Service Fee	38.00		
			Customs	21.00		
			Lost Gear	300.00		
			Radio Phone	-		
			Depth Sounder	150.00		
Total	300	00	Total	509.00	30,000	00
CREW EXPENSES			1/5 Boat Share		6,000	00
Food $800.00			Balance		24,000	00
Gear Repairs	300	00	Total Expenses		5,200	00
Fuel and Oil	2,000	00	Net Stock		18,800	00
Ice	600	00	8 Shares		2,350	00
Bait	1,400	00	Boat Share		6,000	00
Miscellaneous	-		Less 10% Captain		600	00
Condemned gear _____			Net Boat Share		5,400	00
_____			Phone and Sounder		150	00
_____			Balance Boat Share		5,550	00
_____			Less:			
_____			Boat Accounts			
_____	900	00				
Total	5,200	00				

CREW

Crew Names	Bonus	Share	Food	Net
Captain _____	$600.00	$2,350.00	$100.00	$2,850.00
Assistants _____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
_____		2,350.00	100.00	2,250.00
	600.00	$18,800.00	$800.00	$18,600.00

Table A-8

Example of Herring Seine Settlement

In account with_____ Company's Name

Boat_____ Date Jan.-Feb.1954

Fisherman's Name_____

Address_____

Total Tonnage Caught	1,700 tons
Pool Tonnage	400 tons
Each Fisherman's Share 400 x .90¢	$ 360.00
Captain's Bonus	360.00
	720.00
Less:	
Food Share	50.00
	$ 670.00

Note: The settlement of herring shares is made on a pool basis. The catch of a number of different seine boats is pooled and all fishermen who have fished an equal length of time receive equal shares. All fuel costs are paid by processing companies. The captain's bonus (as shown in the above settlement) was equal to one fisherman's share in 1954. The rate of the share per ton of herring (shown as 90 cents above) varies from year to year in accordance with the herring agreements negotiated between processing companies and the fishermen's union. The herring settlement differs from the salmon and halibut settlements as it has no allotted boat share. All herring seine boats are either owned by companies or chartered from independent owners at a per diem rate.

Table A-9

Capital Depreciation Rates

Item	Year Acquired	Depreciation Rate
		%
(1) Boat Hulls	1954	4
	1953	6
	1952 and earlier	5
(2) Engines		
Low speed: e.g., all diesels, East Hope, Vivian, Palmer	1954	7½
	1953	10
	1952 and earlier	10
High speed: e.g., Chrysler, Nordberg, Kermath	1954	7½
	1953	15
	1952 and earlier	10
(3) Powered Equipment		
Gurdies, drum drives, anchor winch	1954	4
	1953	6
	1952 and earlier	5
(4) Radios and Echo Sounders	1954	10
	1953	20
	1952 and earlier	15
(5) Auto Pilots	1954	5
	1953	10
	1952 and earlier	10
(6) Shore Equipment	1954	5
	1953	10
	1952 and earlier	10

Note: The above rates were used in 1954. For 1953 records, the same rates were used, although they were, of course, moved back one year in time. First-year rates were set at half the rate allowed for a full year because some fishermen acquired boats and equipment mid-way through the year.

Table A-10

Quantity of Canned Salmon Packed in British Columbia,
Four-year Averages* 1903-1954

Year	Sockeye	Pink	Chum	Other Salmon	Total
	'000 Cases**	'000 Cases	'000 Cases	'000 Cases	'000 Cases
1903-06	558	35	-	91	684
1907-10	519	69	15	102	705
1911-14	584	242	103	174	1,103
1915-18	327	418	324	264	1,333
1919-22	296	411	197	218	1,122
1923-26	358	579	575	207	1,719
1927-30	318	657	563	217	1,755
1931-34	303	350	292	209	1,154
1935-38	385	523	499	250	1,657
1939-42	439	383	648	308	1,778
1943-46	321	466	386	188	1,361
1947-50	303	519	422	191	1,435
1951-54	517	636	382	168	1,703
Annual Average 1903-54	402	407	339	199	1,347

Source: Unpublished data, Salmon Base Book, Canada Department of Fisheries, Ottawa. The pack for 1951-1954 was taken from the Pacific Fisherman Yearbook, Miller Freeman Publications, Portland, Oregon, 1955, p. 104.

* The four-year periods correspond with the life cycle of most races of sockeye caught in Canadian waters. Pink have a two-year cycle and chum have a 3 to 5 year cycle.

** All quantities are in 48 pound cases.

Table A-11

Market and Export Values* of Canned and Other Forms of Salmon, British Columbia, 1949-1954

Year	Canned Salmon	Other Salmon	Total Market Value	Exported Canned	Exported Other	Total Export Value
	$'000	$'000	$'000	$'000	$'000	$'000
1949	27,654	8,244	35,898	11,924	5,564	17,488
1950	31,368	17,334	48,702	10,246	11,594	21,840
1951	47,368	13,382	60,750	11,550	8,527	20,077
1952	28,505	11,990	40,495	8,140	8,844	16,984
1953	36,035	11,901	47,936	14,645	7,770	22,415
1954	38,402	11,882	50,284	23,964	7,849	31,813
Total	209,332	74,733	284,065	80,469	50,148	130,617
Annual Average	34,889	12,455	47,344	13,411	8,358	21,769

Source: Statistics of Canada's Fisheries, Department of Fisheries, Ottawa.

* Figures shown under total market value are not strictly comparable with export values, since total market values are f.o.b. plant while export values are the declared values of exporters, generally, at the points where fish exports are consigned.

Table A-12

Salmon Landings, Quantity and Value by Districts and by Species, British Columbia, 1945-1955

Species	Year	Quantities Landed (Thousand lb.) District 1	District 2	District 3	Total All Districts	Value of Landings (Thousand Dollars) District 1	District 2	District 3	Total All Districts
Sockeye	1945				24,778				3,436
	1946				40,638				5,890
	1947				21,586				3,298
	1948				19,717				4,043
	1949	5,049	10,731	3,306	19,086	1,010	1,832	551	3,393
	1950	3,682	20,257	5,401	29,340	773	4,052	1,080	5,905
	1951	7,545	17,550	4,720	29,815	1,886	4,387	1,184	7,457
	1952	6,751	19,858	4,258	30,867	1,688	4,965	1,064	7,717
	1953	8,333	18,580	8,424	35,337	1,841	4,099	1,848	7,788
	1954	15,603	11,462	19,936	47,001	3,481	2,528	4,389	10,398
	1955	3,161	8,494	4,988	16,643	765	2,043	1,195	4,003
Coho	1945				31,057				3,131
	1946				21,200				2,198
	1947				20,143				2,443
	1948				24,256				5,047
	1949	1,129	9,715	10,844	21,688	160	1,491	1,779	3,430
	1950	1,722	7,288	11,014	20,024	380	1,438	1,896	3,714
	1951	1,221	13,818	17,172	32,211	222	2,815	3,595	6,632
	1952	664	7,314	11,630	19,608	90	1,009	1,805	2,904
	1953	622	6,806	13,677	21,105	72	940	1,927	2,939
	1954	992	8,253	9,684	18,929	135	1,313	1,685	3,133
	1955	552	8,576	12,406	21,534	99	1,646	2,404	4,149
Pink	1945				65,504				1,868
	1946				10,701				325
	1947				50,682				2,334
	1948				26,732				1,977
	1949	6,775	21,250	27,767	55,792	440	1,327	1,901	3,668
	1950	35	25,199	10,108	35,342	2	1,746	809	2,557
	1951	5,032	30,686	24,294	60,012	479	2,918	2,320	5,717
	1952	4	38,052	13,193	51,249	1	3,045	1,056	4,102
	1953	6,592	9,656	45,264	61,512	490	701	3,318	4,509
	1954	1	23,204	2,529	25,734	ø	1,799	197	1,996
	1955	5,343	19,122	38,641	63,106	485	1,675	3,457	5,617

Table A-12 (Continued)

Species	Year	Quantities Landed (Thousand lb.) District 1	District 2	District 3	Total All Districts	Value of Landings (Thousand Dollars) District 1	District 2	District 3	Total All Districts
Chum	1945				36,401				1,086
	1946				62,436				2,089
	1947				58,528				2,488
	1948				60,249				6,146
	1949	3,616	16,931	14,917	35,464	289	924	1,331	2,544
	1950	10,661	36,011	39,364	86,036	1,279	2,210	5,511	9,000
	1951	6,203	28,353	28,935	63,491	682	2,202	3,114	5,998
	1952	8,712	10,013	13,137	31,862	714	551	1,084	2,349
	1953	4,790	20,482	29,153	54,425	407	1,127	2,248	3,782
	1954	7,241	23,876	43,282	74,399	639	1,373	3,441	5,453
	1955	1,619	7,062	9,497	18,178	207	496	1,096	1,799
Other	1945				13,225				1,747
	1946				14,701				2,310
	1947				11,861				2,014
	1948				14,214				2,740
	1949	3,657	3,416	7,822	14,895	570	557	1,470	2,597
	1950	3,029	3,098	7,831	13,958	580	604	1,976	3,160
	1951	2,626	2,974	6,465	12,065	507	589	1,496	2,592
	1952	2,182	3,684	7,513	13,379	370	623	1,490	2,483
	1953	3,163	3,405	7,967	14,535	507	656	1,667	2,830
	1954	3,418	2,919	6,462	12,799	471	532	1,596	2,599
	1955	2,379	2,412	6,758	11,549	444	528	1,941	2,913
Total All Species	1945				170,965				11,268
	1946				149,676				12,812
	1947				162,800				12,577
	1948				145,168				19,953
	1949	20,226	62,043	64,656	146,925	2,469	6,131	7,032	15,632
	1950	19,129	91,853	73,718	184,700	3,014	10,050	11,272	24,336
	1951	22,627	93,381	81,586	197,594	3,776	12,911	11,709	28,396
	1952	18,313	78,921	49,731	146,965	2,863	10,193	6,499	19,555
	1953	23,500	58,929	104,485	186,914	3,317	7,523	11,008	21,848
	1954	27,255	69,714	81,893	178,862	4,726	7,545	11,308	23,579
	1955	13,054	45,666	72,290	131,010	2,000	6,388	10,093	18,481

Ø Less than five hundred dollars.

Note: Data on salmon species by districts were not available prior to 1949.

Table A-13

Minimum Contractual Prices for Gillnet and Seine Salmon, at Beginning of Salmon Fishing Seasons, British Columbia, 1945-1956

Year	Sockeye	Coho and Red Spring	Pink	Chum
		(Cents per lb.)		
1945	13¼ - 14½	7¾ - 8½	2¼ - 2¾	2¼ - 2¾
1946	14 - 15	8½ - 9	2¾ - 3¼	2¾ - 3¼
1947	15	10½	3¼ - 3¾	3¼ - 3¾
1948	18	14	6¾ - 7¼	6 - 6½
1949	18	14	6 - 6½	5¼ - 5¾
1950	20	14	6¾ - 7¼	5¼ - 5¾
1951	25	18	9½	7½
1952	25	13	7½	5½ - 8
1953	22	11	7¼	5½ - 8
1954	22	13	7¾	5¾ - 8
1955	24	15	8¾	6½ - 9
1956	24	15	9	6½ - 9

Table A-14

Average Annual Prices* Paid to Fishermen for Salmon, British Columbia, 1945-1955

Year	Sockeye	Coho	Red and Pink Spring	White Spring	Pink	Chum	All** Salmon
			(Cents per lb.)				
1945	13.87	10.08	17.09	6.22	2.85	2.98	6.59
1946	14.49	10.37	18.03	8.95	3.04	3.35	8.56
1947	15.28	12.13	19.24	10.24	4.61	4.25	7.73
1948	20.50	20.81	21.66	12.54	7.40	10.20	13.74
1949	17.78	15.81	20.00	11.61	6.58	7.17	10.64
1950	20.13	17.56	25.90	14.44	7.09	10.82	13.18
1951	25.01	20.59	24.11	14.68	9.52	9.45	14.37
1952	25.00	14.81	20.65	12.03	8.00	7.37	13.31
1953	22.04	13.93	22.97	12.82	7.33	6.95	11.69
1954	22.12	16.55	25.23	12.80	7.76	7.33	13.18
1955	24.05	19.27	29.86	14.87	8.90	9.90	14.11

* These average prices were obtained by dividing total landed values by landed weights. They represent prices received by all salmon fishermen, including trollers as well as gillnet and seine fishermen.

** Average prices for all salmon species include prices paid for steelhead.

Table A-15

Frequency Distribution of 508 Seine Boats by Value of Salmon Landed, British Columbia, 1954

Landed Value Class	Boats		Value of Landings	
	Number	Cumulative Percentage	Total Value	Cumulative Percentage
$	No.	%	$	%
Under - 5,001	90	17.7	257,778	2.9
5,001 - 10,000	75	32.5	563,576	9.3
10,001 - 15,000	97	51.6	1,222,994	23.3
15,001 - 20,000	79	67.2	1,379,309	39.2
20,001 - 25,000	56	78.2	1,260,842	53.6
25,001 - 30,000	37	85.5	1,009,145	65.1
30,001 - 35,000	23	90.0	747,287	73.6
35,001 - 40,000	17	93.3	641,998	80.9
40,001 - 45,000	15	96.3	619,405	88.0
Over - 45,000	19	100.0	1,054,014	100.0
Total	508		8,756,348*	

* This total was taken from the Department of Fisheries' sales slip statistics. It is only 3.7 per cent below the estimated value of $9.1 million reported by seiners in the landing statistics.

Table A-16

Net Value of Production by Industries and Percentage Distribution, British Columbia, 1952-1954

	1952		1953		1954	
	$'000	Per cent	$'000	Per cent	$'000	Per cent
Agricultural	64,497	5.2	69,464	5.3	68,581	5.2
Forestry 1/	161,994	13.1	162,577	12.3	174,416	13.1
Fisheries	30,158	2.4	31,280	2.4	34,458	2.6
Trapping	813	0.1	709	0.1	568	2/
Mining	115,524	9.3	85,098	6.4	94,781	7.1
Electric Power	41,258	3.3	45,265	3.4	49,467	3.7
Manufactures	556,172	44.9	615,686	46.6	651,813	49.0
Construction 1/	268,593	21.7	310,455	23.5	256,177	19.3
Total	1,239,009	100.0	1,320,534	100.0	1,330,261	100.0

Source: Survey of Production, 1950-54, Dominion Bureau of Statistics, Ottawa.

1/ Includes Yukon and Northwest Territories.

2/ Less than 0.1 per cent.

Note: Values listed as agricultural, forestry, fisheries and trapping are those for the production of primary products. Processing of these products is included under manufactures.

APPENDIX C

Forecasting the Effect of Changes in Receipts and Expenses on Net Income

Among the uses that may be made of information obtained from this survey, one of the more important is employing the data to examine the effect that changes in individual items of either receipts or expenses, would have on salmon fishermen's net incomes. In the 1953 interim report, a detailed table was given (Table A-18), showing the percentage changes that would occur in net receipts with a given change in items of receipts and expenses. When the survey was continued for 1954 with 172 records completed from the same fishermen interviewed in 1953, it provided a further opportunity to check the table given in the 1953 report.

In Table A-17, the actual changes in the 172 fishermen's receipts and expenses are applied to the percentage calculations of the 1953 table and the expected change in net receipts in 1954 (as shown by the forecast table) is compared with the actual net receipts reported by these fishermen.

Although these calculations are summarized for total receipts and expenses only, the same net result would be obtained if the comparison had been made for individual items of receipts and expenses. A study of Table A-17 reveals that if the percentage indices of the changes which occured had been known, by using the calculations shown in the 1953 report it would have been possible to estimate the net receipts of all four types of salmon fishermen in 1954 with a very small margin of error.

Taking the sample of gillnetters as an example, the detailed table provided in the 1953 report showed that an increase of 8.1 per cent in total receipts would (if all expenses remained the same) cause a 14.9 per cent increase in net cash receipts. Similarly, the increase of 1.7 per cent in expenses would cause a 1.4 per cent decline in net receipts. Combining these two changes therefore, the effect on net receipts would be an increase of 14.9 per cent minus 1.4 per cent, or an increase of 13.5 per cent. The actual increase in net receipts was 13.1 per cent.

In making the above comparisons for these 172 salmon fishermen, it should be pointed out that the 1953 calculations of these relative changes in net receipts were based on records obtained from 266 salmon fishermen. From the results shown in Table A-17 it may be concluded that although the 1954 survey did not include the operations of 94 fishermen which had been interviewed in 1953, nevertheless, the data for both years are in agreement and the relative proportions of receipt and expense items are probably quite representative.

Table A-17

Comparison of 1953 Forecast of Expected Change, with Actual Change in Net Receipts, for 172 Salmon Fishermen, British Columbia, 1953 and 1954

Items for	1953	1954	Actual Change Relative to 1953	1953 Forecast of Effect on Net Receipts
	$	$	%	%
64 Gillnetters				
Total Receipts	207,222	223,955	+ 8.1	+ 14.9
Total Expenses	90,997	92,556	+ 1.7	- 1.4
Net Receipts	116,225	131,399	+ 13.1	+ 13.5
51 Trollers				
Total Receipts	148,417	140,486	- 5.4	- 8.4
Total Expenses	49,727	46,308	- 6.9	+ 3.8
Net Receipts	98,690	94,178	- 4.6	- 4.6
32 Seine Assistants				
Total Receipts	83,799	96,588	+ 15.3	+ 17.4
Total Expenses	9,617	10,710	+ 11.4	- 1.6
Net Receipts	74,182	85,878	+ 15.8	+ 15.8
25 Seine Captains				
Total Receipts	223,528	245,808	+ 10.0	+ 16.3
Total Expenses	75,669	76,462	+ 1.0	- 0.6
Net Receipts	147,859	169,346	+ 14.5	+ 15.7

Table A-18

Effect of a Ten Per Cent Change in Particular Items of Receipts and Expenses on Net Cash Receipts, 1953

Receipts	89 Gillnetters		89 Trollers		51 Seine Assistants		37 Seine Captains	
	Cash Operating Receipts	Effect on Net Cash Receipts	Cash Operating Receipts	Effect on Net Cash Receipts	Cash Operating Receipts	Effect on Net Cash Receipts	Cash Operating Receipts	Effect on Net Cash Receipts
	$	% (+ or -)	$	% (+ or -)	$	% (+ or -)	$	% (+ or -)
Sockeye	154,269	10.2	2,025	0.1	18,024	1.7	29,394	1.7
Spring	14,740	1.0	97,043	6.0	748	0.1	3,554	0.2
Coho	13,129	0.9	102,207	6.4	6,274	0.6	10,049	0.6
Pink	27,678	1.8	3,826	0.2	37,035	3.4	76,265	4.5
Chum	43,994	2.9	15,563	1.0	22,979	2.1	57,930	3.4
Other	864	-	622	-	196	-	223	-
Total salmon	254,674	16.8	221,286	13.7	85,256	7.9	177,415	10.4
Other fish	17,694	1.1	20,807	1.3	27,043	2.5	52,640	3.1
Total fish	272,368	17.9	242,093	15.0	112,299	10.4	230,055	13.5
Other Fishery Receipts	7,344	0.5	8,212	0.5	10,595	1.0	47,401	2.8
Total Cash Operating Receipts	279,712	18.4	250,305	15.5	122,894	11.4	277,456	16.3
Expenses								
Fuel & Oil	24,411	1.6	28,762	1.8	5,497	0.5	13,317	0.8
Bait & Ice	1,025	0.1	2,815	0.2	1,512	0.1	1,723	0.1
Catching Material & Repairs	13,618	0.9	20,426	1.3	1,279	0.1	35,228	2.1
Purchases of gillnets	59,035	3.9	-	-	280	-	-	-
Hull Painting & Repairs	4,710	0.3	9,062	0.5	488	0.1	14,708	0.9
Engine & Equipment Repairs	6,897	0.5	8,904	0.5	526	0.1	12,231	0.7
Fish Clothes	2,247	0.1	2,915	0.2	2,152	0.2	2,329	0.1
Wages Paid	882	-	1,852	0.1	10	-	839	0.1
License Fees, Transportation	2,384	0.2	2,031	0.1	1,627	0.2	3,411	0.2
Insurance	3,853	0.2	8,254	0.5	897	0.1	17,374	1.0
Interest	417	-	1,141	0.1	297	-	4,662	0.3
Rentals	7,113	0.5	1,383	0.1	35	-	580	-
Other Expenses	1,219	0.1	1,687	0.1	41	-	380	-
Total Cash Operating Expenses	127,811	8.4	89,232	5.5	14,641	1.4	106,782	6.3
Net Cash Operating Receipts	151,901	10.0	161,073	10.0	108,253	10.0	170,674	10.0

Note: Beside each receipt and expense item in the Table is shown the percentage by which the net cash operating receipts increase or decline, if there is a 10 per cent increase or decline in the amount shown for that particular item, assuming that all other receipts and expenses remain constant.

APPENDIX D

Size and Representativeness of Survey Samples

Survey Procedure:

One of the first matters considered in the planning of this survey was that of dealing with the number of fishermen to be included in the sample and how such fishermen were to be selected in order to be representative of all types of salmon fishermen in British Columbia.

As all commercial fishermen in British Columbia are required to be licensed it was decided to use the alphabetical card index of fishermen, maintained in the Vancouver office, as the basis for determining the fishing population and drawing the sample. The licence holders were separated on the basis of their home address into the three Fishery Districts, and then were further sub-divided on the basis of type of licence held. Samples were drawn representing each sub-group and after the surveys were completed, the records were separated into four main groupings on the basis of the most important source of income. These groupings are the following:

(1) Gillnet
(2) Troll
(3) Seine Assistant
(4) Seine Captains

All licensed fishermen in British Columbia cannot be considered as commercial fishermen and in drawing the list of names to be interviewed, consideration was given to the number of persons in each sub-group from whom complete records could be expected. Altogether, 826 names were selected for interview and in 1953 enumerators were able to contact 552 of these fishermen. A total of 266 complete records were obtained from these contacts.

When the survey was continued to cover the 1954 fishing year, it was decided to interview the same fishermen from whom complete records were taken in 1953, in an attempt to obtain comparative two-year records. However, it was not possible in the time at the disposal of enumerators to make all of these contacts. Even if more time had been spent in the field it would have been impossible to obtain records from all of the 266 fishermen as some had died since 1953 and others had left the fishing industry. However, enumerators were able to obtain records from 172 of the same fishermen and, using the same random sample list derived for 1953, records were completed from an additional 84 fishermen who were not contacted in 1953.

For the purpose of this survey, a commercial fisherman was defined as one who:

(1) fished at least 14 days during the year, and
(2) had received gross receipts of at least $250 from salmon fishing, and
(3) had gross receipts from salmon fishing that represented at least 20 per cent of total net income for the year.

Assistants were not included unless they received a definite share from fishing. Several of those in the sample were wives of fishermen who went along with their husbands and were thus required to take out a licence. In the 1954 enumeration no attempt was made to interview those fishermen who were contacted in 1953 but did not qualify under the definition, as commercial fishermen. It is possible some of these might have qualified in 1954 but it was decided that the time spent in re-interviewing this group to find out if they were eligible would not be justified.

Of the 552 persons interviewed in 1953, 270, or almost half of them, did not qualify as commercial fishermen. However, this percentage cannot be applied to all types of fishermen, because in order to get an adequate number of trollers where the percentage of ineligible fishermen was higher, it was necessary to take a larger sample (Table A-19).

It will be noted that the percentage of completed records, in relation to the actual number of licences, ranged from 1.9 per cent for gillnet fishermen to 8.9 per cent for seine captains. The higher ratio for captains was necessary in order to get a sample size which would have statistical validity.

On a district basis, the sample ratio ranged from 2.1 per cent in Districts 1 and 3 to 2.9 per cent in District 2. The higher percentage of records in District 2 was due to the smaller number of fishermen in this district that were eliminated because they did not qualify as commercial fishermen.

In 1954 the sample ratio by districts changed slightly from that of 1953, with a higher number of records from District 1. Enumerators completed 121 records in District 1, 43 in District 2 and 92 in District 3. The percentage of complete records from gillnetters was higher than in 1953 but the records from trollers represented a smaller percentage. The number of records from captain and assistant seine

Table A-19

Sample of Salmon Fishermen Selected in British Columbia, 1953

	Number of Licensed Fishermen	Number Selected for Interview	Per cent of Total	Number Contacted	Number of Complete Records	Per cent of Total
	No.	No.	%	No.	No.	%
By Type of Fishermen						
Gillnet	4,660	227	4.9	135	89	1.9
Troll	4,224	409	9.7	306	89	2.1
Seine Captain	415	73	17.6	47	37	8.9
Seine Assistant	2,445	117	4.8	64	51	2.1
Total	11,744	826	7.0	552	266	2.3
By Districts						
District 1	4,489	271	6.0	155	96	2.1
District 2	2,054	136	6.6	83	60	2.9
District 3	5,160	419	8.1	314	110	2.1
Other than Coastal	41	-	-	-	-	-
Total	11,744	826	7.0	552	266	2.3

Note: Although the number of licensed fishermen gives an indication of the number participating in fishing, salmon licence fees are only $1 and some people buy a licence but do not fish during the year. Recent changes in licensing requirements will provide more information.

fishermen was approximately the same in both years. These sample ratios are shown in Table A-20.

Comparison of Averages from Complete Samples with those of Matched Records:

Although the 172 matched records taken from the same fishermen for both 1953 and 1954 are most useful in making an assessment of fishermen's incomes and

Table A-20

Sample of Salmon Fishermen Interviewed in British Columbia, 1954

Type of Fishermen	Number of Licensed Fishermen	Number of Complete Records	Per cent of Total
	No.	No.	%
Gillnet	4,885	96	2.0
Troll	4,112	66	1.6
Seine Captain	458	41	9.0
Seine Assistant	2,386	53	2.2
Total	11,841	256	2.2

the changes occuring in these two years, the additional single year records can be combined with the two-year records to show average incomes for the complete samples of fishermen.

The number of single and two-year records completed during the survey are shown in Table A-21.

For all types of fishermen except seine captains, the two-year averages calculated from the matched records show little change when the additional single records are added and averages calculated on a complete sample basis (Table A-22). It should be obvious, therefore, that the characteristics of these smaller samples of fishermen are still very similar to those of the complete samples.

In comparing average incomes from paired records and complete samples for seine captains, it will be noted that the paired records show higher averages. Total net cash incomes, for example, averaged $6,870 for paired records and $6,255 for the complete samples. Due to the larger number of records in the complete samples of seine captains, the averages for the total 78 records are probably more representative of the fishing industry in these two years than the averages from the 50 paired

Table A-21

Number of Single and Two-year Records Completed from Salmon Fishermen, British Columbia, 1953-1954

Type of Fishermen	All Records Completed in 1953	All Records Completed in 1954	Two-Year Records	Single Year Records*
	No.	No.	No.	No.
Gillnet	89	96	64	57
Troll	89	66	51	53
Seine Captains	37	41	25	28
Seine Assistants	51	53	32	40
Total	266	256	172	178

* Some fishermen, although interviewed in both years, had changed from one type of salmon fishing to another and their records are classed as single-year records.

records.[1] However, the two-year records provide the most effective means of measuring certain changes that occurred in the fishing industry because the same fishermen would bring similar fishing skill to the industry and would operate similar equipment, for the most part, in both fishing years.

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1 The standard error of estimate was calculated for averages of net cash receipts and found to be slightly lower for the complete samples of seine captains than for the 25 paired records. This indicates that the averages for complete samples may be more representative than those for the smaller sample of paired records.

In regard to the standard error of averages obtained for seine captains, it should be noted, however, that due to the relatively small number of captains in the industry, these errors are not as serious as statistical errors in gillnet and troll samples which represent much larger groups of fishermen in British Columbia.

Table A-22

Comparison of Two-year Averages of Incomes and the Results of Fishing Operations, from Paired Records and Complete Samples of Salmon Fishermen, British Columbia, 1953 and 1954

Item	Unit	Gillnetters		Trollers		Seine Assistants		Seine Captains	
		Paired Records	Complete Samples	Paired Records	Complete Samples	Paired Records	Complete Samples	Paired Records	Complete Samples
No. of fishermen	number	128	185	102	155	64	104	50	78
Two-year averages of									
Days engaged in fishing									
Operations	days	170	162	170	166	128	132	178	174
Afloat	days	82	79	92	90	73	73	92	90
Length of boat (overall)	feet	30	31	34	34	54	55	55	55
Fishing capital	dollars	3,716	3,759	5,084	5,348	710	521	17,062	14,750
Total cash operating receipts	"	3,369	3,393	2,832	2,947	2,818	2,751	9,387	8,463
Total cash operating expenses	"	- 1,434	-1,495	- 941	-1,032	- 317	- 301	-3,043	-2,786
Net cash operating receipts	"	1,935	1,898	1,891	1,915	2,501	2,450	6,344	5,677
Non-fishery income	"	/ 797	/ 788	/ 594	/ 614	/ 738	/ 740	/ 526	/ 578
Total net cash income	"	2,732	2,686	2,485	2,529	3,239	3,190	6,870	6,255
Depreciation on fishing capital	"	- 216	- 213	- 335	- 332	- 47	- 32	- 895	- 825
Net income less depreciation	"	2,516	2,473	2,150	2,197	3,192	3,158	5,975	5,430

Note: Two-year averages for complete samples were calculated on a weighted average basis, because of a different number of records taken in 1953 compared with 1954. The weighted averages were derived by taking the averages for each year, adding these and dividing by two.

Comparison of Gross Stocks of Purse Seine Boats:

The Department's sales slip statistics for salmon sales reported by purse-seiners in 1954, provide a means of checking the average gross value of salmon for boats included in the survey with the average calculated for all seiners in British Columbia.

In 1954, the average value of salmon landings for boats operated by the 25 seine captains included in the survey was $21,788. The 32 assistants interviewed fished on boats which averaged $20,843.[1] During this same year, the sales slip records from 508 seine boats showed an average salmon value of $17,236. Of this total number, however, there were 90 seiners which averaged only $2,864 and a further analysis of these indicated that they were primarily large trollers. The average salmon stocks of the remaining 418 seiners (which would be more comparable with those included in the survey)[2] was $20,332.

Calculations of Sample Error:

Statistical calculations show that the standard error of estimate of income averages for gillnet and troll fishermen were considerably lower than those for seine fishermen, particularly those for seine captains. This would be expected, however, as the range in seine fishermen's receipts was much greater than those for gillnet and troll fishermen. Some calculations of the standard error of these averages (Table A-23) indicate the reliability of the averages shown.

Summary:

Those persons who wish to make use of the statistics shown in this report should bear in mind that the survey data were derived from a comparatively small sample of salmon fishermen and, although efforts were made to obtain a representative sample of the industry, the figures are not absolute or applicable to the entire population of salmon fishermen. In confining the survey within the limits of the definition used for commercial salmon fishermen, those who earned less than the minimum required to be eligible were not included. Among salmon fishermen, particularly trollers, there were part-time operators who earned less than $250 or did not fish 14 days. Several of the gillnetters and assistant seine fishermen interviewed also failed to qualify as commercial fishermen. The data shown in this report do not represent these minor groups of fishermen.

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1 These captains and assistants were the fishermen interviewed in both survey years. For the complete sample of 41 seine captains interviewed in 1954, the average salmon gross stock was $21,281. The boats on which the 53 assistants fished during 1954 averaged $22,888.

2 Of the boats fished by seine captains and assistants, only one was a troller. The others were the normal table-seine and drum-seine boats.

Table A-23

Summary of Calculations of the Standard Error of Net Cash Operating Receipts for Samples of Salmon Fishermen, British Columbia, 1953 and 1954

Samples of	Year	Number of Fishermen	Average Net Receipts	Standard Deviation	Standard Error
		No.	$	$	$
Gillnetters	1953	89	1,707	1,222	130
	1954	96	2,090	1,658	171
Trollers	1953	89	1,810	1,394	148
	1954	66	2,021	1,446	179
Seine Assistants	1953	51	2,123	1,788	253
	1954	53	2,776	1,883	261
Seine Captains	1953	37	4,613	3,594	599
	1954	41	6,742	4,595	727

Note: The standard error of average net cash operating receipts for the two-year samples of seine assistants and captains were as follows:

For 32 seine assistants - 1953 average $2,318, Standard error $356
1954 average $2,684, Standard error $355

For 25 seine captains - 1953 average $5,914, Standard error $712
1954 average $6,774, Standard error $742

With the accurate information available concerning fishing receipts and expenses, the information on these items is quite reliable. However, other information, such as the data pertaining to fishermen's capital equipment, depended to a greater extent on judgement by individuals. All of this information is necessary, nevertheless, as it contributes to a better assessment of the financial position of fishermen.

In estimating the total value of primary fishing capital in British Columbia from the values obtained for these samples of gillnet, troll and seine boats and equipment, it was found that the statistical blow-up of capital obtained from the samples was within 10 per cent of the total capital value of $51 million reported in the Department of Fisheries statistics in 1954.[1]

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1 Valuation of capital equipment in the primary fishing industry and the methods or concepts of value have been of some concern to Fisheries statisticians. In British Columbia, all boats of 10 tons or more are now inventoried on a current market or sales value basis. Statistics on smaller boats and fishing gear are more difficult to compile due to the larger number of units and methods of valuation for this equipment are still being revised to achieve more accurate and uniform data.

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